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September 17, 2018

REF: EXE-216-18

Honorable Mitchell Englander, Chair
Public Safety Committee
Room 360, City Hall
Los Angeles, CA 90012

Honorable Monica Rodriguez, Chair
Information Technology and General Services Committee
Room 360, City Hall
Los Angeles, CA 90012

Richard Llewellyn, City Administrative Officer
Office of the City Administrative Officer
200 N. Main St., 15th Floor
Los Angeles, CA 90012

Subject: **REPORT BACK ON FY 2018-19 ADOPTED BUDGET INSTRUCTION #75
ON THE TIMELINE FOR REPLACING EXISTING GPS TRANSPONDERS
ON LAPD AND LAFD HELICOPTERS – COUNCIL FILE 18-0600-S132**

Dear Honorable Councilmembers and Mr. Llewellyn:

The ITA, on May 4, 2018, reported to Budget and Finance Committee during the budget process the need for LAPD and LAFD to meet FAA requirements to install Automatic Dependent Surveillance – Broadcast (ADS-B) GPS technology on all aircraft by January 2020. Subsequently, funding in the amount of \$1M was included as a line item in the Unappropriated Balance Adopted Budget for FY18-19 for this project with instruction to report back, in concert with the LAPD and LAFD, on the timeline for replacement of the existing GPS transponders on LAPD and LAFD helicopters (C.F. 18-0600-S132).

The FAA has mandated installation of ADS-B technology to replace ground radar and navigational aids with tracking systems using more precise satellite signals. All aircraft must have this equipment installed by January, 2020. LAPD has 10 helicopters and LAFD has 5 helicopters that must be modified to comply. To meet the FAA mandate to have the equipment installed in all aircraft in operation after January 2020, and the on-going aircraft maintenance required for normal FAA compliance, ADS-B work must begin by no later than the first week of November 2018.

ADS-B technology provides Air Traffic Control (ATC) in Class A, B, and C airspace with more accurate data of all aircraft within that airspace. Compliance entails replacement of the current transponder system with one capable of transmitting aircraft GPS position, vertical speed and aircraft tail number. Future revision of this system will also provide cockpit displays that allow pilots to see the same airspace environment that ATC sees, as well as pinpoint hazardous weather and terrain, and give pilots important flight information, such as temporary flight restrictions.

LAPD SOLUTION

The recommendation to bring the LAPD helicopters into compliance includes a uniform type of equipment from Garmin International - A GTN650 and GTX345R. These systems will be installed in 9 of the 10 aircraft, with the 10th (Bell 412) requiring a slightly different set of equipment due to aircraft restrictions on that particular airframe. This equipment is already in use in two LADWP aircraft, and four LAPD aircraft. The LAPD has two Bell 206 helicopters as well. ITA, GSD and the LAPD all agree that since keeping fleet standardization is a priority, the Garmin equipment should be used across the board. Spare parts would also be purchased to ensure that equipment is on-hand for subsequent repairs. The total cost for the LAPD compliance upgrade including GSD labor charge for 10 LAPD helicopters is \$620,126.



LAFD SOLUTION

The ITA, with the support of GSD, sought and researched options for the LAFD aircraft to achieve compliance. Because of the size, weight, and purpose of the Agusta AW139 chosen by LAFD, the FAA has strict guidelines that must be adhered to when it comes to aftermarket installations and upgrades. An installation of this complexity requires that it be substantiated by teams of engineers, and go through rigorous flight testing and approvals prior to its release or sale to the public. Due to the category/type of the Agusta AW139, there are only two types of ADS-B equipment currently in the United States that have been certified for use in this aircraft.

ITA and GSD staff worked with the manufacturers of both types of equipment to achieve clarity on the hardware that is included, the certified installation process required, and to

confirm successful implementation by other customers. The first equipment option, described in detail below, is provided by the Agusta factory (Leonardo helicopters in partnership with Honeywell Aerospace), and is in use by over 60 Agusta AW139 helicopters flying in the United States. The LAFD has confirmed that all other public safety agencies deploying Agusta AW139 helicopters have implemented the Honeywell equipment to achieve ADS-B compliance.

The second option, the L-3 Lynx, is a more cost-effective, stand-alone transponder. However, the Lynx has not been installed in any Agusta AW139 aircraft in North America and staff was unable to obtain reference information from the Brazilian company that is using this equipment in an Agusta AW139. The Lynx has only been utilized thus far in much smaller, and less sophisticated aircraft, not involved in public safety response. Additionally, integrating this third-party aftermarket equipment into the complex Honeywell platform introduces ongoing support and maintenance issues. For example, due to the night vision (NVG) certification on LAFD aircraft, the Lynx system would need to be sent to a third-party vendor for modification, de-modification, and re-certification each time the equipment is removed or installed for repair or upgrade. That would likely add at least a week to the repair process, increasing aircraft downtime.

While it took time to fully explore all options for technology emerging to address ADS-B compliance, thorough review is warranted for such a consequential and costly equipment decision. Based on the results of that extensive research, and due to the untested status of the Lynx transponder under use conditions required of public safety pilots and aircraft, it is the consensus of the ITA, LAFD, and GSD that the best option for an emergency services vehicle is the Honeywell Suite because it has been proven.

For the two LAFD Bell 206 aircraft, ITA, GSD and the LAFD concur that the City should standardize on the same Garmin ADS-B compliance equipment used for LAPD.

DETAILS OF LAFD EQUIPMENT

The LAFD aircraft have an entire integrated avionics suite of equipment in their cockpit (see picture). All the equipment pictured below constitutes only about half of the total Honeywell Epic suite. All these components are connected to a computer system that digitizes what is happening in the flight environment and displays visually on the monitors.

Currently, the transponder is part of that suite and is controlled like the rest of the radios, on one controller.



This report recommends upgrading the entire Honeywell Epic suite for three LAFD aircraft to Phase 7 (Fire 3 and 5 are both Phase 4, and Fire 2 is Phase 5). Phase 7 replaces older GPS receivers, gyros, and the mainframe computer that processes all the data being processed in the aircraft. In addition to the upgrades, this also adds features like a 4-axis autopilot which is more stable, a flight data recorder to better understand the aircraft overall health, as well as addresses ADS-B compliance. Installation time is projected at six to eight weeks for each helicopter, with work being done by City staff.

Meeting ADS-B compliance through the upgrade to Phase 7 provides the following operational benefits:

- New equipment with no in-service mileage should perform more reliably
- Aircraft “down-time” would be further minimized due to interchangeability of parts. The turn-around time to receive a replacement part is 24 to 48 hours. With all aircraft updates to the Phase 7 software system and components, Avionics maintenance staff would be able to swap out a failed component with one from a helicopter already grounded for maintenance. Thus, the airworthy helicopter could return to service within a few hours, as opposed to days.
- Standardizing the Honeywell Epic suite from the current three software navigation systems (Phases 4, 5 and 7) to one system (Phase 7) promotes continuity of training, pilot efficiency, and crew safety. Each system requires different navigational operational sequences. In the event of an in-flight emergency, pilots must make split second decisions, relying on rote memory to mitigate or prevent a bad outcome. Being able to regularly navigate the same operational system in

all five LAFD Agusta AW139's enhances pilots' capabilities to properly and quickly react during in-flight emergencies.

The total cost for the LAPD and LAFD air fleet ADS-B compliance is \$987,321 for FY 18-19 and \$1,398,342 for FY 19-20 for a total project cost of \$2,385,662.

Attachment 1 details the cost and timeline schedule for commencing upgrade work on each aircraft. The work start dates were selected in conjunction with the helicopter's annual inspection dates to minimize downtime for the aircraft.

The table below summarizes the funding required by FY.

	FY 18-19	FY 19-20	Total
LAPD	\$367,290	\$252,836	\$ 620,126
LAFD	\$620,031	\$1,145,506	\$1,765,537
Total	\$987,321	\$1,398,342	\$2,385,663

Funding for \$1M was approved as a line item in the FY 18-19 Unappropriated Balance budget for this project.

RECOMMENDATIONS

The ITA requests that Council approve the following recommendations:

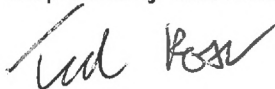
1. Appropriate \$987,321 from the Unappropriated Balance, Fund 100/58, Fire and Police GPS Transponders line item, to the following departments and accounts:

Fund 100/40, General Services Account 001090, Salaries Overtime	\$91,800
Fund 100/40, General Services Account 003090, Field Equipment Expense Account	\$35,300
Fund 100/32, Information Technology Agency Account 009350, Communication Services	\$860,221

FISCAL IMPACT STATEMENT

There would be no additional General Fund impact for this project in FY 18-19. An approximately \$1.4M impact is anticipated in FY19-20.

Respectfully submitted,



Ted Ross, General Manager
Information Technology Agency

Attachment

Report Back on FY 2018-19
September 17, 2018

cc: Felicia Orozco, CD 7
Joshua Drake, CLA
Matias Farfan, CLA
Tyler Munhall, CAO
Trina Unzicker, CAO
Edward Roes, CAO
Melissa Fleming, CAO
Janice Chang Yu, CAO
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Angela Sherick, AGM, GSD
Richard Coulson, GSD
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Doug Postal, GSD
Chief Charles Combs, LAFD
June Gibson, LAFD
Sean Parker, LAPD
Charles Springer, LAPD
Annemarie Sauer, LAPD
Captain Sean Parker, LAPD
ITA Executive Team
Greg Steinmehl, ITA
Iain Blackwood, ITA

Attachment 1

SUMMARY:			
	GSD Share	ITA Share	Total
GRAND TOTAL FY 18/19	\$127,100	\$860,220	\$987,320
GRAND TOTAL FY 19/20	\$43,600	\$1,354,742	\$1,398,342
Total:	\$170,700	\$2,214,962	\$2,385,662

Dept	Tail	Comm/Nav/GP	Recommendation	Start date *	FISCAL YEAR 18-19 COST			FISCAL YEAR 19-20 COST		
					GSD Parts	GSD Labor	ITA Parts and Equipment	GSD Parts	GSD Labor	ITA Parts and Equipment
LAPD	N662PD	GNS430/waas	GTX 345R/ GTN650	11/1/18	\$2,000	\$6,800	\$32,301.09			
LAPD	N661PD	GNS430/waas	GTX 345R/ GTN650	1/10/19	\$2,000	\$6,800	\$32,301.09			
LAPD	N213PK		GTX 345R/ GTN725	3/18/19	\$2,750	\$13,600	\$46,182.67			
LAPD	N229LA	kx155/apollo	GTX 345R/ GTN650	4/18/19	\$5,250	\$8,500	\$32,301.09			
LAPD	N665PD	GNS430/waas	GTX 345R/ GTN650	5/22/19	\$2,000	\$6,800	\$32,301.09			
LAPD	N913WB	GNS430/waas	GTX 345R/ GTN650	8/15/19	\$2,000	\$6,800	\$32,301.09			
LAPD	N3202Q	kx155/apollo	GTX 345R/ GTN650	9/12/19	\$5,750	\$10,200	\$32,301.09			
LAPD	N228LA	kx155/apollo	GTX 345R/ GTN650	10/2/19	\$5,250	\$8,500	\$32,301.09			
LAPD	N664PD	GNS430/waas	GTX 345R/ GTN650	11/7/19				\$2,000	\$6,800	\$32,301.09
LAPD	N-222DM		GTX 345R/ GTN750	11/21/19						\$43,380.30
LAPD	N668PD	GNS430/waas	GTX 345R/ GTN650	12/18/19				\$2,000	\$6,800	\$32,301.09
LAPD	Spare		GTX345R X 2	1/3/20						\$12,847.44
LAPD	Spare		GTN650 x2	1/3/20						\$64,602.17
LAPD	Spare		GTN 750 X1	1/3/20						\$43,380.30
LAPD	Spare		GTX 345 x1	1/3/20						\$6,423.72
LAPD Sub-Total:					\$27,000	\$68,000	\$272,290	\$4,000	\$13,600	\$235,236.10
Dept	Tail	Comm/Nav/GP	Recommendation	Start date *	GSD Parts	GSD Labor	ITA Parts and Equipment	GSD Parts	GSD Labor	ITA Parts and Equipment
LAFD	N303FD		Honeywell Phase VII	11/1/18	\$2,800	\$10,200	\$559,753			
LAFD	N305FD		Honeywell Phase VII	09/2019				\$2,800	\$10,200	\$559,753.05
LAFD	N306FD		GTX 345/ GNS Upgrade *	6/14/19	\$2,750	\$6,800	\$14,088			
LAFD	N302FD		Honeywell Phase VII	1/2020				\$2,800	\$10,200	\$559,753.05
LAFD	N601CC		GTX 345/ GNS Upgrade *	03/2019	\$2,750	\$6,800	\$14,088			
LAFD	N304FD		Already complied with							
LAFD Sub-Total:					\$8,300	\$23,800	\$587,930	\$5,600	\$20,400	\$1,119,506
Total Project Cost:					\$35,300	\$91,800	\$860,220	\$9,600	\$34,000	\$1,354,742.20