

**HELICOPTER FLEET ASSESSMENT
WORKSHOP**

MAY 10, 2022



2022 CALENDAR

January-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

March-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

May-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

July-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

September-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

November-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

February-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

April-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

June-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

August-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

October-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

December-2022						
SUN	MON	TUES	WED	THUR	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Holidays
 Meetings
 Conferences

Helicopter Fleet Assessment Workshop

Florida Keys Mosquito Control District
Marathon Office
503 107th Street
Marathon, FL 33050

May 10, 2022
1:30 pm (approximate)

- 1. Call to Order**
- 2. Roll Call**
- 3. Approval of Agenda**
- 4. Purpose of the Workshop:** Chairman Goodman announces the purpose of this workshop is to discuss the Florida Keys Mosquito Control District's aerial fleet analysis following the addition of the Airbus H125s.
- 5. Good of the Order**
- 6. Meeting Adjourned**



FLORIDA KEYS MOSQUITO CONTROL DISTRICT

AIRBUS H-125 ANALYSIS



AGENDA

AIRBUS H-125 vs Bell 206

- **2018 Fleet Replacement Plan Review**
- **Direct Maintenance Cost of the Airbus H125 vs the Bell 206b (Bruce Holden)**
- **Aircraft on Ground (AOG) H125 vs B206**
- **Operational Usage**
- **Operational Increases in Efficiency with the Airbus H-125**
- **Summary**
- **Questions?**



2018 FLEET ANALYSIS

In 2018 a Fleet Analysis was conducted in order to begin a fleet upgrade and standardization. Analysis included:

- Maintenance cost over a five year period
- Aircraft utilization per flight hour
- Operating cost per flight hour
- Aircraft availability
- Application cost per pound (Larvicide)



Reasons for Fleet Replacement (2018 Presentation)

- Aircraft Age
- Increased maintenance cost from unscheduled maintenance due to age and corrosion
- Maintenance Instability and extended aircraft downtimes
- Issues and Hazards associated with non-Standard fleet
- Pilot Shortage due to multiple type and rating requirements
- Increased Training Cost for multi-type Fleets



Four-Year Plan (from 2018 presentation)

Year 1

- Lease to buy 2 new Airbus H-125 Aircraft with the above mentioned options to replace the aging Bell 206 B3 Aircraft. Lease to buy option is 10/12 years renewable each year.
- Upon delivery of new aircraft, sell both Bell 206B3 (N90097 & N3686X) aircraft to place towards future lease payments. Estimated value according to Conklin & deDecker is \$925,000.

Year 2-3

- Upon successful completion of a full season utilizing H-125 aircraft for combination of Granular Larvicide Operations and ULV Missions without the need for fixed-wing assets. Sell N700FK and N770FK. Estimated Value is \$1,175,000.

Year 3

- Place order for 2 additional Airbus H-125 aircraft to complete standardization of the FKCD fleet to single type, single model aircraft.

Year 3-4

- Sell both Bell 206 L4 aircraft (N175MS & N173MS) to apply towards future lease payments. Combined value estimated at \$1,825,000.



Cost/Benefit Analysis

Cost/Benefit Analysis Cost Savings - Airbus Helicopters

As Replacements of Bell 206B Helicopters			Year -->	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Cost Data	per unit	units												
Airbus Cost	\$ 3,984,240	2		7,968,480										
Total Cost				7,968,480										
Benefit Data	per hour	hours												
Maint Savings vs. Bell Long Rangers	\$ 715.43	68.08		48,704	50,165	51,670	53,220	54,817	56,461	58,155	59,900	61,696	63,547	
Maint Savings vs. Bell Jet Rangers	\$ 465.77	254.42		118,502	122,057	125,718	129,490	133,375	137,376	141,497	145,742	150,114	154,618	
Overtime Savings - Fewer Missions				10,335	10,645	10,964	11,293	11,632	11,981	12,340	12,710	13,092	13,485	
Total benefit				177,540	182,866	188,352	194,003	199,823	205,818	211,992	218,352	224,903	231,650	
Annual Cash Savings or (Cost)				177,540	182,866	188,352	194,003	199,823	205,818	211,992	218,352	224,903	231,650	
Net Present Value @ 1%				<u>1,125,234</u>										
Inflation Estimate		3%												

Larviciding Cost By Aircraft

Based on Actual Application Rates per hour

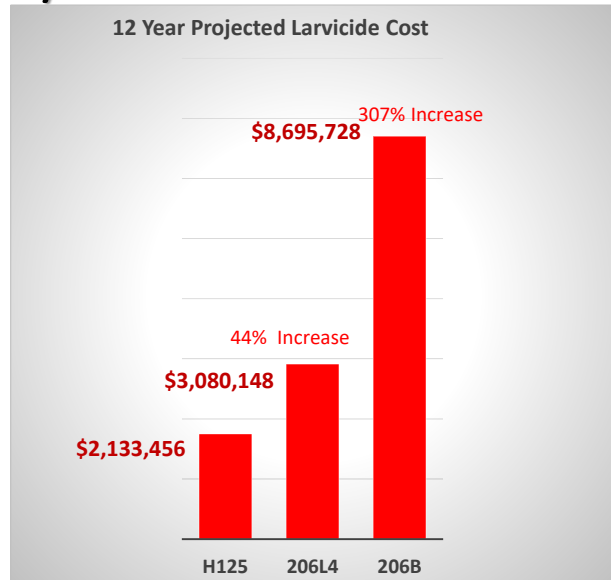
Bell 206B Jet Ranger 86 acres per hour
 Bell 206L4 Long Ranger 112 acres per hour
 Airbus H-125 157 acres per hour

Application Cost per Lb.

Bell 206B = **\$1.27 per lb**

Bell 206L4 = **\$.45 per lb**

Airbus H125 = **\$.31 per lb**



AIRCRAFT MAINTENANCE DOWN TIME

- One of the main reasons for fleet replacement was aircraft down time (AOG) due to unscheduled maintenance or delayed part replacement times on older aircraft:
- Bell 206 Jet Rangers were AOG for a combined total of 68 weeks in 2019 due to maintenance items
- Airbus H125's were AOG for 10 Weeks combined for maintenance items in 2021



2019 Maintenance Flights

26-Oct	Regelmann	175MS	0.2																Maint / O C F Post 100 hr inspection Mark			
8-Aug	Regelmann	173MS	0.1																Maint / OCF post 100 Hr Insp			
24-Jul	Regelmann	175MS	0.2																Maint / OCF Track & Balance			
22-Oct	Regelmann	770FK							0.4										Maint / OCF turn Gyro Mark			
22-Oct	Regelmann	700FK							0.5										Maint / OCF turn Gyro Mark			
17-Apr		700FK							2.3										Maint / ORL Services Pitot Cert Mark			
1-Feb		175MS	2.0																Maint / Peninsular Avionics Glen	glen, Kate		
18-Jan		90097				1.9													Maint / Peninsular Avionics Mark			
17-Jan		173MS	2.3																Maint / Peninsular Avionics Mark, Kate			
23-May		90097				2													Maint / Penn. Avi, Kate			
23-Apr		6386X				2.2													Maint / Penn. Avionics, Kate			
7-Jun	Regelmann	770FK							2.0										Maint / Pitot sys Cert at peninsula			
24-Jan		90097				0.2													Maint / Posit AC on grid for annual check, Mark			
1-Jun	Regelmann	175MS	0.1																Maint / post 100 Hr Inspect			
24-May		6386X				0.2													Maint / Post 100 Hr OFC Mark			
24-Jan		175MS	0.3																Maint / Post Annual Inspection acceptance Mark			
29-May	Cullingford	6386X				0.2													Maint / power Check			
20-Jul	Regelmann	700FK							0.5										Maint / Pre Trip Test			
29-Nov	Cullingford	770FK							0.2										Maint / Right Vacuum check			
14-Sep	Newton	175MS																	Maint / Skid tube test			
9-Aug	Newton	173MS	0.1																Maint / Spider Tracks			
26-Apr		175MS	0.5																Maint / Spidertrack check, Kate, Mark			
20-Jul	Newton	90097				0.1													Maint / Spidertracks check			
1-Jun	Regelmann	700FK							0.5										Maint / Spray System Check			
5-Jun	Regelmann	700FK							0.3										Maint / Spray System Check			
18-Jun	Regelmann	770FK							0.4										Maint / Spray System Check			
24-Apr		700FK							1.0										Maint / Spray System Check-Mark, Tom			
12-Dec	Regelmann	770FK							0.3										Maint / Systems Check			
16-Feb		6386X				0.5													Maint / Test dual Spray head system Mark			
29-Jan		175MS	0.4																Maint / Track & Balance Mark			
19-Jul	Newton	6386X				0.3													Maint / Track & Balance check			
15-Jan	Kate	175MS	0.1						2.3										Maint / Wash, Kate			
15-Jan		6386X				2.3													Maint/ Peninsular Avionics Glen	Glenn, Kate		
Maint Flights 63			10.8	13.7	15.1	0.0	0.0															
Total Hrs 39.6																						

39.6 flight hours in 2019 for maintenance flights alone



2021 Maintenance Flights

Showing 1 to 48 of 48 entries

Copy PDF (P) PDF (L) CSV Excel Print Search:

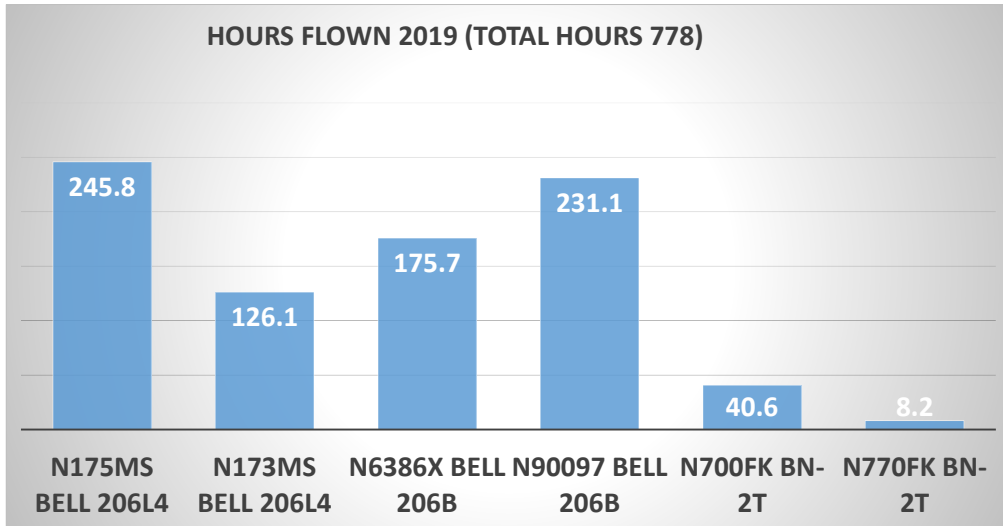
Flight Date	Flight Type	Flight Time	Acres	Product Lbs	Product Gallons	NAS Flight Time	NAS Acres	NAS Product Lbs	NAS Product Gallons	Zone
3/31/2021	MAINTENANCE	0.1	0.0	0	0.0	0.0	0	0	0.0	
3/31/2021	MAINTENANCE	0.0	0.0	0	0.0	0.0	0	0	0.0	
3/26/2021	MAINTENANCE	0.3	0.0	0	0.0	0.0	0	0	0.0	
3/23/2021	MAINTENANCE	0.3	0.0	0	0.0	0.0	0	0	0.0	
3/4/2021	MAINTENANCE	0.2	0.0	0	0.0	0.0	0	0	0.0	
2/24/2021	MAINTENANCE	0.3	0.0	0	0.0	0.0	0	0	0.0	
2/23/2021	MAINTENANCE	0.3	0.0	0	0.0	0.0	0	0	0.0	
2/3/2021	MAINTENANCE	0.3	0.0	0	0.0	0.0	0	0	0.0	
1/7/2021	MAINTENANCE	0.0	0.0	0	0.0	0.0	0	0	0.0	
1/7/2021	MAINTENANCE	0.0	0.0	0	0.0	0.0	0	0	0.0	
1/6/2021	MAINTENANCE	0.3	0.0	0	0.0	0.0	0	0	0.0	
1/4/2021	MAINTENANCE	0.0	0.0	0	0.0	0.0	0	0	0.0	
Total: 48	Flight Type	Total: 10.6	Total: 0.0	Total: 0	Total: 0.0	Total: 0.0	Total: 0	Total: 0	Total: 0.0	Zone

10.6 flight hours in 2021 for maintenance flights only

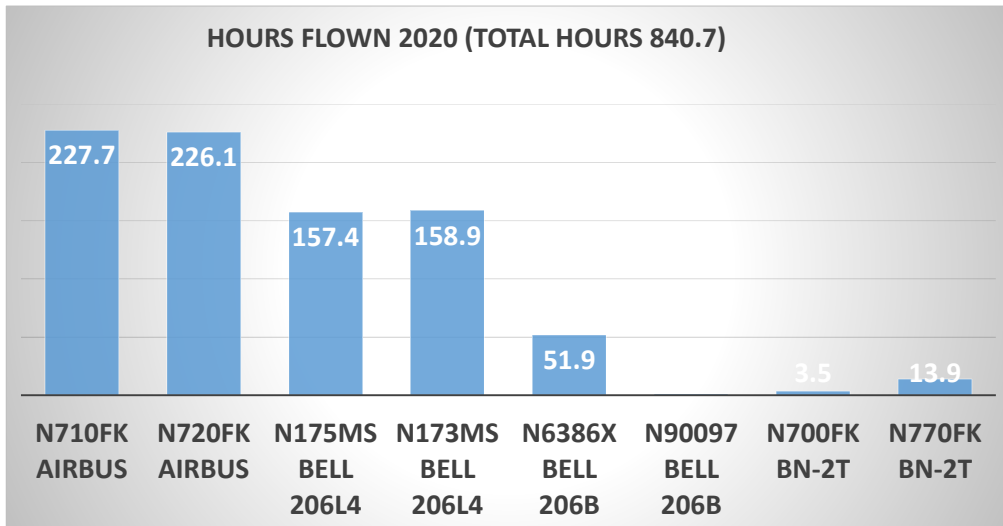
73.43 % decrease in post maintenance flight hours!



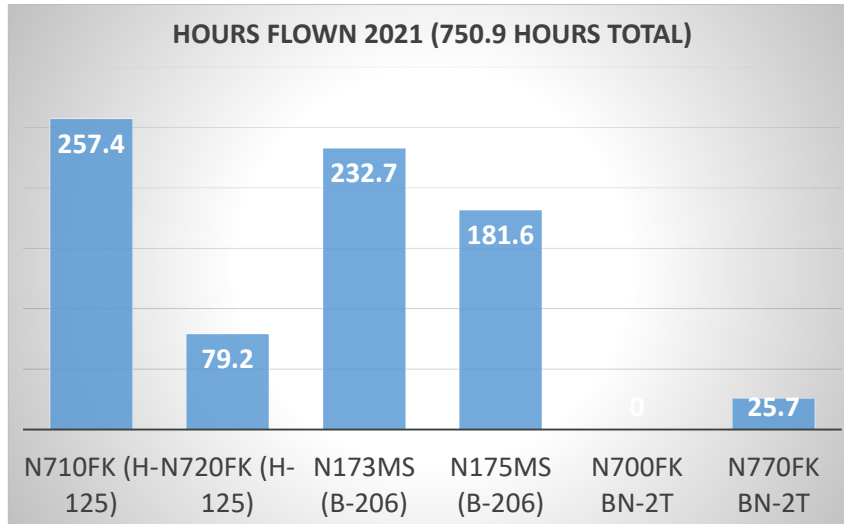
Operational Usage



Operational Usage



Operational Usage



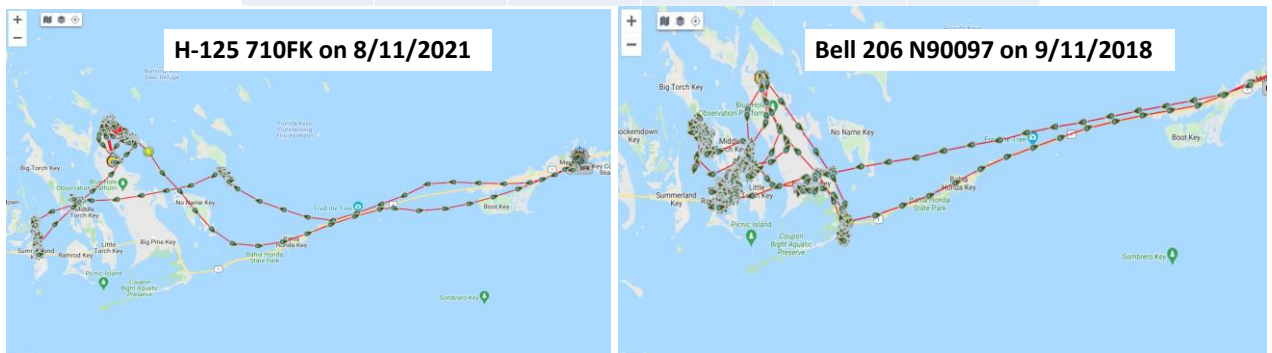
Aerial efficiency examples H125 vs B206

- Data was collected and summarized from a combination of older spreadsheets maintained by the flight staff and maintenance staff, Spidertracks Data, and Digital Airware Data post 2019.
- Each mission day is completely different with no 2 parameters being the same. Never the same polygons to be treated, weather, aircraft availability that day, locations, etc....
- Analyzed actual mission day treatment results while comparing each aircraft with similar hours of operation, location, and spray type.



Efficiency example #1 - H125 vs B206B3 Larviciding Mission

Date	Aircraft	Hours	Miles	Acres	Acres per Hour
8/11/2021	Airbus N710FK	2.6	139	409	157.3
9/11/2018	Bell 206-B N90097	2.6	155	192	73.8



Efficiency example #1 - H125 vs B206B3 Larviciding Mission

Date	Aircraft	Hours	Miles	Acres	Acres per Hour
8/11/2021	Airbus N710FK	2.6	139	409	157.3
9/11/2018	Bell 206-B N90097	2.6	155	192	73.8

In 2.6 hours the Bell Jet Ranger completed 192 acres vs the Airbus H-125 which completed 157.3 in the same amount of time. Had the Jet Ranger completed 409 acres it would have taken 5.5 hours to complete. **Airbus is a 53% increase in granular larviciding capabilities per hour.**

Using Airbus H-125 the District saved 2.9 hours on the helicopter, flight crew, and ground crew

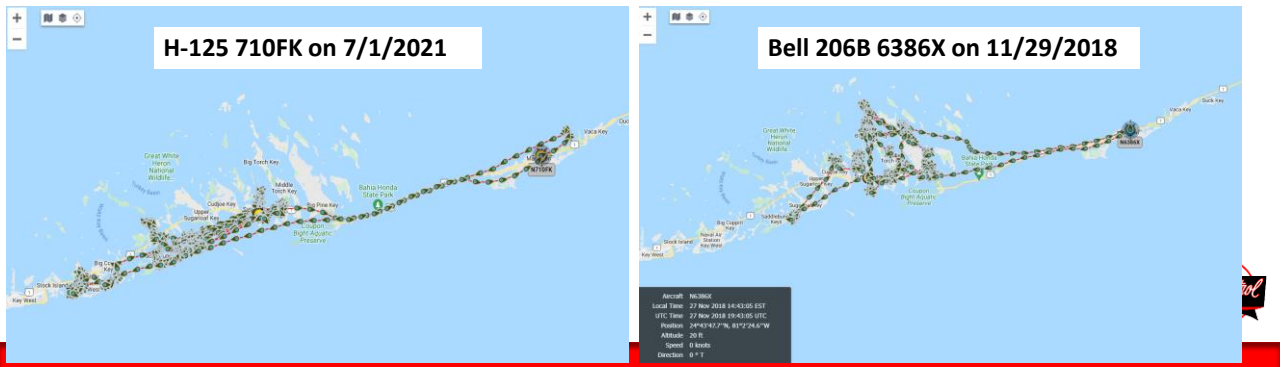
Maintenance cost Saving of \$1350.73

Saved the Pilot 2.9 hours additional flight time and fatigue (increasing safety) an implied savings of \$306.00



Efficiency example #2 - H125 vs B206B3 Larviciding Mission

Date	Aircraft	Hours	Miles	Acres	Acers per Hour
7/1/2021	H125 710FK	7.2	374	1011	140
11/29/2018	B206 6386X	7	256	704	100



Efficiency example #2 - H125 vs B206B3 Larviciding Mission

Date	Aircraft	Hours	Miles	Acres	Acers per Hour
7/1/2021	H125 710FK	7.2	374	1011	140
11/29/2018	B206 6386X	7	256	704	100

Bell 206 Jet Ranger flew for 7.0 hours and completed 704 acres while the Airbus H-125 completed 1011 acres in the same amount of time. Had the Bell 206 Jet Ranger completed 1011 acres it would have taken 10.1 hours to complete.

Using Airbus H-125 the District saved 2.91 hours on the helicopter, flight crew, and ground crew

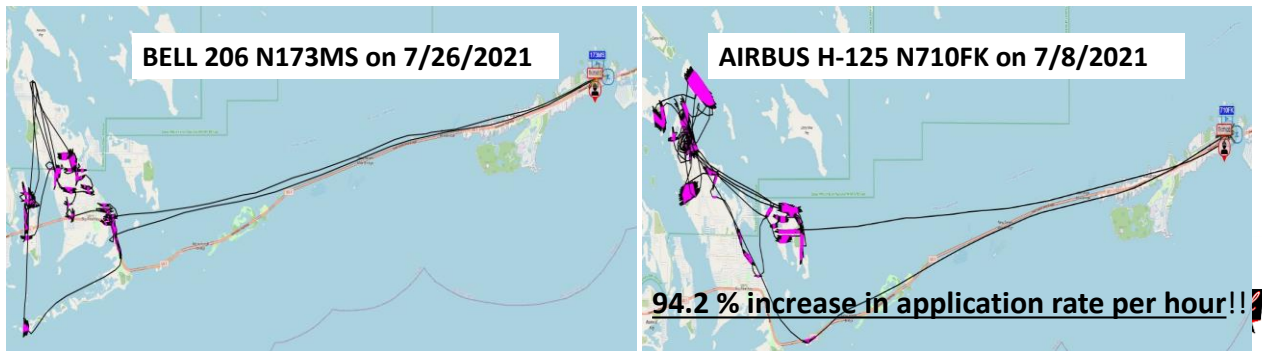
Maintenance cost Saving of \$1355.39

Pilot saving of 2.9 hours additional flight time and fatigue (increasing safety) at an impied savings of \$306.00.



Efficiency example #3 - H125 vs B206B3 Larviciding Mission

Date	Aircraft	Hours	Miles	Acres	Acres per Hour
7/26/2021	Bell 206 N173MS	6.1	263.8	547	89.6
7/8/2021	Airbus N710FK	6.1	267.6	1066	174



Efficiency example #3 - H125 vs B206B3 Larviciding Mission

Date	Aircraft	Hours	Miles	Acres	Acres per Hour
7/26/2021	Bell 206 N173MS	6.1	263.8	547	89.6
7/8/2021	Airbus N710FK	6.1	267.6	1066	174

If Bell 206 Long Ranger was to complete 1066 acres it would have taken 10.1 hours to complete instead of the 6.1 hours that the H-125 took.

Using Airbus H-125 the District saved 5.7 hours on the helicopter, flight crew, and ground crew

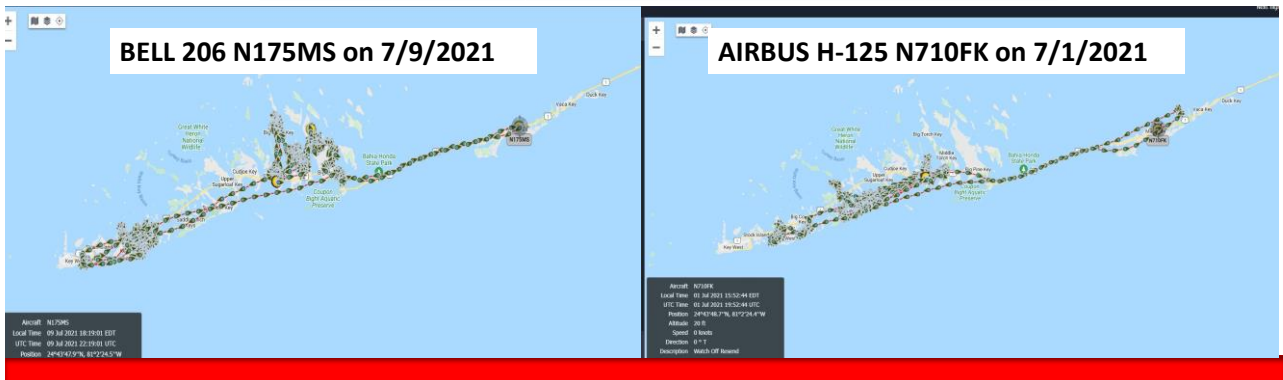
Maintenance cost Saving of \$4077.95

Saved the Pilot 5.7 hours additional flight time and fatigue (increasing safety) and an implied savings of \$601.46.



Efficiency example #4 - H125 vs B206B3 Larviciding Mission

Date	Aircraft	Hours	Miles	Acres	Acres per Hour
7/9/2021	Bell 206 N175MS	9.2	1034	452.1	112
7/1/2021	Airbus N710FK	<u>7.2</u>	1020	429.7	<u>140</u>



Efficiency example #4 - H125 vs B206B3 Larviciding Mission

Date	Aircraft	Hours	Miles	Acres	Acres per Hour
7/9/2021	Bell 206 N175MS	9.2	1034	452.1	112
7/1/2021	Airbus N710FK	<u>7.2</u>	1020	429.7	<u>140</u>

Bell 206 Long Ranger took 902 hours to complete 1034 acres while the Airbus H-125 only took 7.2 hours to complete. Long Ranger would have needed 9.1 hours to complete

Using Airbus H-125 the District saved 1.9 hours on the helicopter, flight crew, and ground crew

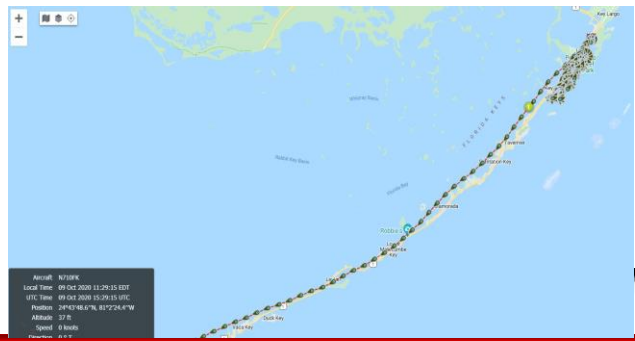
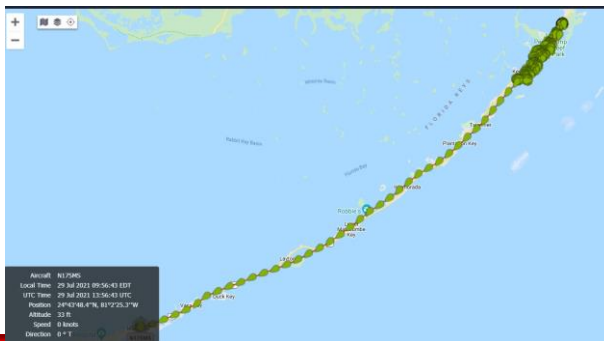
Maintenance cost Saving of \$1359.32

Saved the pilot 1.9 hours additional flight time and fatigue (increasing safety) and an implied savings of \$200.48.



Efficiency example #5 – H-125 vs B206L WDG, Dengue Fever Outbreak

Date	Aircraft	Hours	Miles	Acres	Acres per Hour
7/29/21	Bell 206 N175MS	4.1	179	1406	342
10/9/20	Airbus N710FK	<u>2.7</u>	166	1378	<u>510</u>



Efficiency example #5 – H-125 vs B206L WDG, Dengue Fever Outbreak

Date	Aircraft	Hours	Miles	Acres	Acres per Hour
7/29/21	Bell 206 N175MS	4.1	179	1406	342
10/9/20	Airbus N710FK	<u>2.7</u>	166	1378	<u>510</u>

Bell 206 Long Ranger took 4.1 hours to complete 1406 acres. Airbus H-125 completed same mission in only 2.7 hours.

Using Airbus H-125 the District saved 1.4 hours on the helicopter, flight crew, and ground crew

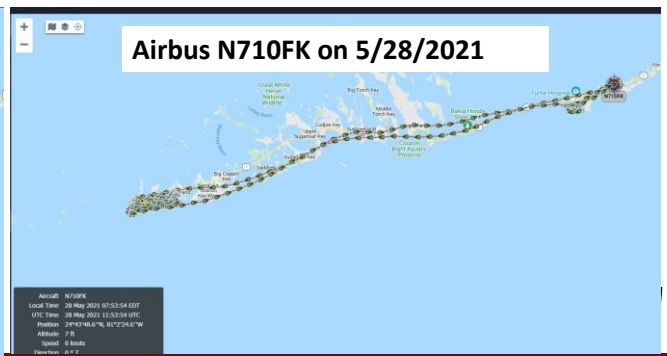
Maintenance cost Saving of \$1001.60

Saved the pilot 2.7 hours additional flight time and fatigue (increasing safety) and an implied savings of \$147.72



Efficiency example #6: H125 vs B206B ULV mission

Date	Aircraft	Hours	Miles	Acres
8/2/2018	Bell 206-B N90097	2.6	147	3121
5/28/2021	Airbus N710FK	<u>1.6</u>	146	3026



Efficiency example #6: H125 vs B206B ULV mission

Date	Aircraft	Hours	Miles	Acres	Acres per Hour
8/2/2018	Bell 206-B N90097	2.6	147	3121	1200
5/28/2021	Airbus N710FK	<u>1.6</u>	146	3026	<u>1891</u>

Bell Jet Ranger completed 3121 acres ULV in Key West taking 2.6 hours. Airbus H-125 completed same mission in only 1.6 hours.

Using Airbus H-125 the District would save 1 hours on the helicopter and flight crew. VERY important given the 2 hour window post sunrise to completed the mission.

Maintenance cost Saving of \$465.77 for the single Ultra Low Volume flight.

Saved the pilot 1 hour additional flight time and fatigue (increasing safety) at an implied savings of \$105.52 per hour.



Example #7 – ULV Airplane vs Airbus H-125

Date	Aircraft	Hours	Acres	Acres per Hour
9/28/18	BN-2T N700FK	2.4	5749	2395
7/31/21	Airbus N710FK	2.3	5590	2565
7/3/19	BN-2T N700FK	2.5	6286	2514
10/1/20	Airbus N710FK	2.8	6026	2164



2021 Missions NOT requiring ground crews with H-125

2/18/21 – 108 acres - zone 6,7,8

2/9/21 – 140 acres – zone 8

6/4/21 – 161 acres – zone 8

6/19/21 – 105 acres – zone 2

6/17/21 – 120 acres – zone 1

6/28/21 – 111 acres – zone 2,4

6/30/21 – 123 acres – zone 2,10

7/14/21 – 152 acres – zone 3,4

8/23/21 – 103 acres – zone 5

8/31/21 – 125 acres – zone 5

9/9/21 – 161 acres – zone 5,6

9/28/21 – 152 acres – zone 7,8

10/25/21 – 157 acres – zone 6,7

10/14/21 – 148 acres – zone 5,6

- In 2021 14 missions were able to be completed without ground crew traveling to remote landing zones in upper or lower keys.
- This is due to the 60% increase in granular larvicide capabilities with a single load from the Bell 206B to the Airbus H-125.
- Large impact on busy season operations due to ability to pull one helicopter from LZ and travel north or south to complete smaller acreage requirements.
- This can easily take 2 Flight Support Personnel 3.75 – 4.25 hours of travel, set up, tear down, and loading at an implied cost of \$591.45 - \$670.31.



Summary

- **Actual cost savings on aircraft maintenance realized**
- **Vast improvement of Aircraft on Ground time from unscheduled MX**
- **Improved efficiency in Granular and Liquid Larvicide**
- **H-125 capable of conducting similar ULV missions as Airplane**
- **Less flight hours needed for granular larvicide improving safety of pilots and ground crews**
- **On track with Fleet Replacement plans with further aircraft preparing to be sold in the coming years**

