



TRUCKEE TAHOE AIRPORT DISTRICT

STAFF REPORT

AGENDA TITLE: ACAT Discussion on JTA Diesel Aircraft

MEETING DATE: 3/3/2020

PREPARED BY: Hardy Bullock, Director of Aviation & Community Services

RECOMMENDED ACTION: Offer guidance to staff on the use of the District owned JTA Skyhawk.

DISCUSSION: The aircraft was purchased in 2018 as directed by the Board of Directors. The aircraft (ID number: 5901G) is a new Cessna Skyhawk with a diesel power plant and a composite prop. Several noise studies were completed and results showed a significant reduction in noise energy in comparison to the existing rental aircraft. The objective was to buy the aircraft, lease it to Sierra Aero and remove N1968F, the current

rental aircraft, and reduce noise and annoyance from repetitive training flights. Current metrics indicate a significant reduction in comments associated with training flights and the aircraft is considered a great success in the reduction of noise and annoyance.

5901G's current rental rate is \$150/hour for local flight instruction and rental use. The aircraft is very popular and has become the subject of discussion as it relates to access, use, billable hours, and flight activity.

The aircraft is open to use by any qualified pilot, student pilot, or certified flight instructor that meets the rental requirement outlined by Sierra Aero. The aircraft is scheduled electronically using an application, Flight Schedule Pro.

Recently it has been brought to the attention of Staff that the aircraft is being future booked and utilized nearly exclusively for flight instruction activity. This makes it difficult for others to rent the plane. The District has many certified flight instructors but two instructors primarily use N5901G. The reservation behavior of flight instruction is complex and all flight schools struggle to match resources with student progress while balancing factors like weather, maintenance, and cancellations.

While this is the case, this District owned asset is the responsibility of the District and open to all who wish to enjoy it. Additionally the rental rate was set by the Board as a

means to keep flying affordable for local pilots while keeping parity with current Skyhawk rental rates on the airport.

Figure 1 depicts the average instructor rates, the average rental rates of two variants of Skyhawk and the combined overall basic Skyhawk rental with the instructor. Figure 2 depicts the final rollup in a simplified view. The average rate for flight instruction over 16 airports located across California within metropolis areas, small cities, large towns and rural areas is \$80/hour. Truckee is \$43/hour higher than average with our average at \$123.00/hour. The average rental rate of a G1000 equipped Skyhawk is \$180/hour. Truckee is \$30/hour lower than average at \$150/hour. A student pilot can rent our aircraft, N5901G with an instructor for \$273/hour, which is the market average. The Truckee instructor rate is high and our aircraft rate is low.

WHAT IS NEXT: Staff hopes ACAT will discuss the following concepts:

1. Should the District restrict the use of the aircraft and block time for independent rental separate from instruction for things like scenic flights, visiting pilot use, and local pilot use.
2. Should the District make mandatory use ratios whereby each instruction and student pay for rental time based as a percentage of total time. For example in a three hour rental reservation should we mandate 75% utilization, or 50% etc.?
3. Should the District raise the rate on the aircraft?

4. Should the District cap the instruction rate while being used for commercial instruction?

FISCAL IMPACT: N901G produces a net positive cash flow after maintenance of about \$10,000 annually with approximately 700 hours of use per year. This does not include engine replacement or depreciated value at the end of the useful life.

ATTACHMENTS:

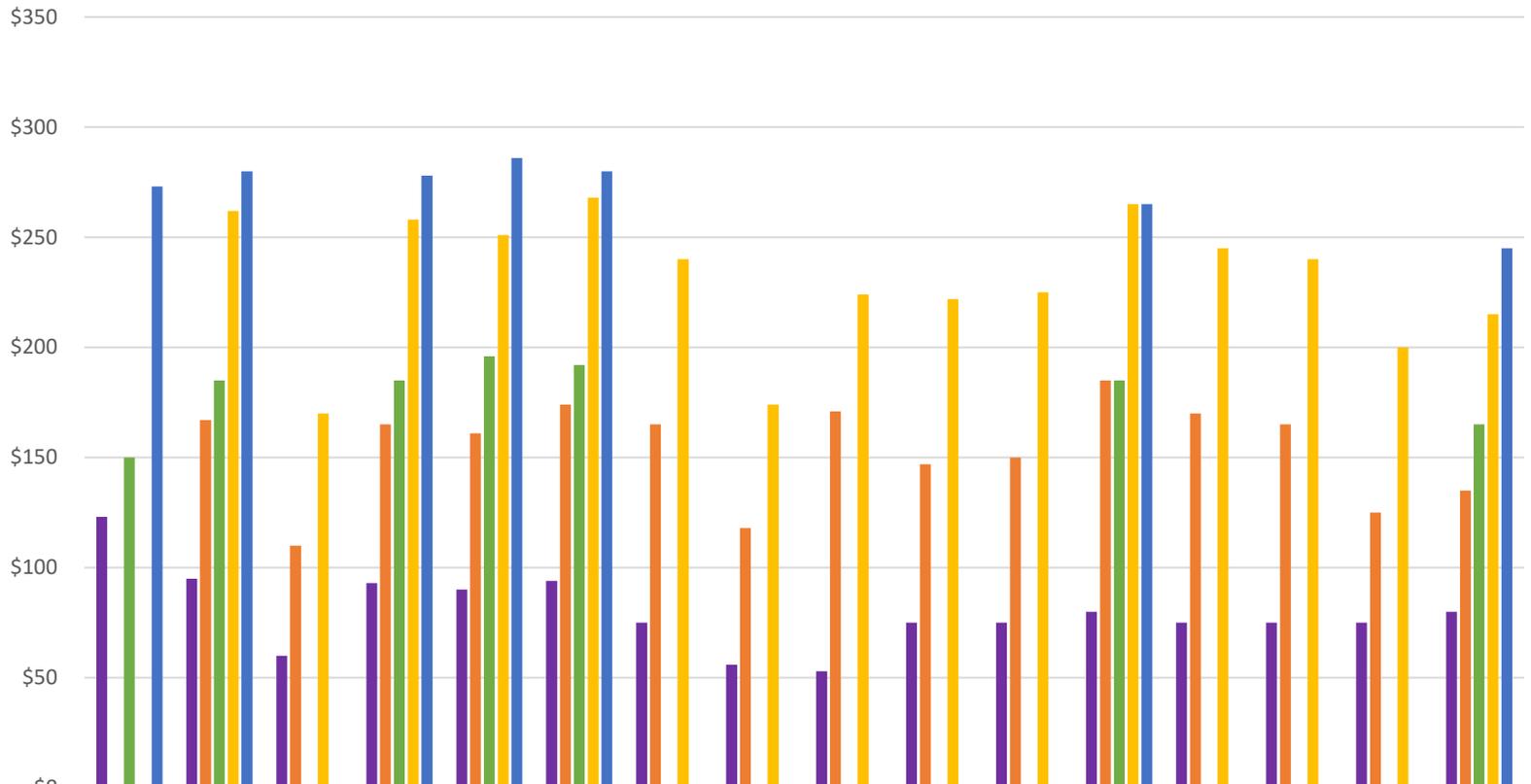
Attachment 1, Figure (1) Graphs Average Rates for Rental & Instruction

Attachment 2, Aircraft Leaseback Agreement

Attachment 3, Cessna JTA Staff Report (with Pro Forma)

Attachment 4, Cessna JTA Acquisition Report

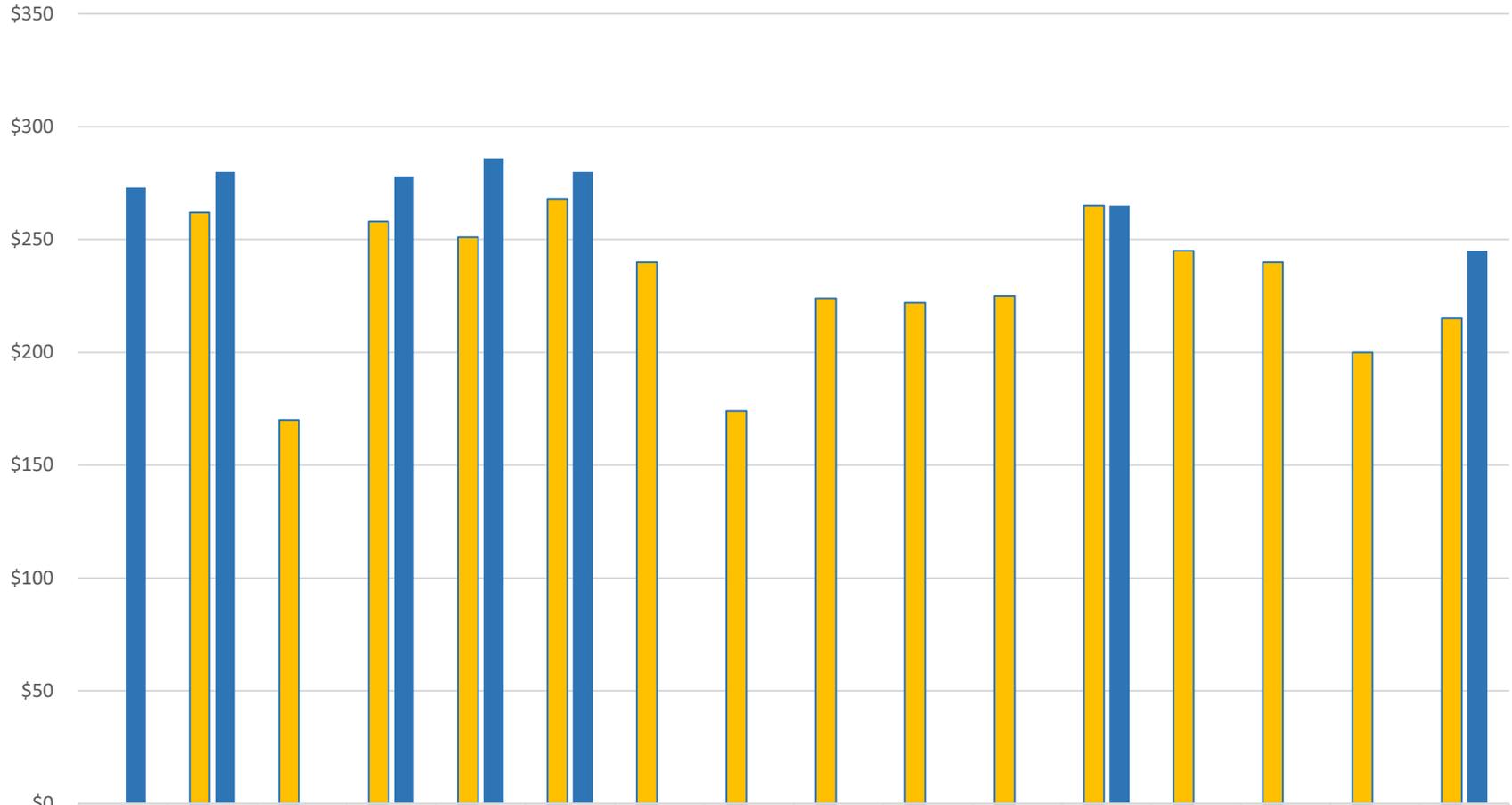
Flight Instruction Comparison



■ Avg. Instructor Rate	\$123	\$95	\$60	\$93	\$90	\$94	\$75	\$56	\$53	\$75	\$75	\$80	\$75	\$75	\$75	\$80
■ Avg. Cessna 172 Rate Wet		\$167	\$110	\$165	\$161	\$174	\$165	\$118	\$171	\$147	\$150	\$185	\$170	\$165	\$125	\$135
■ Avg. Cessna 172 G1000 Rate Wet	\$150	\$185		\$185	\$196	\$192						\$185				\$165
■ Reg. + Instr. Total		\$262	\$170	\$258	\$251	\$268	\$240	\$174	\$224	\$222	\$225	\$265	\$245	\$240	\$200	\$215
■ G100 + Instr. Total	\$273	\$280		\$278	\$286	\$280						\$265				\$245

■ Avg. Instructor Rate
 ■ Avg. Cessna 172 Rate Wet
 ■ Avg. Cessna 172 G1000 Rate Wet
 ■ Reg. + Instr. Total
 ■ G100 + Instr. Total

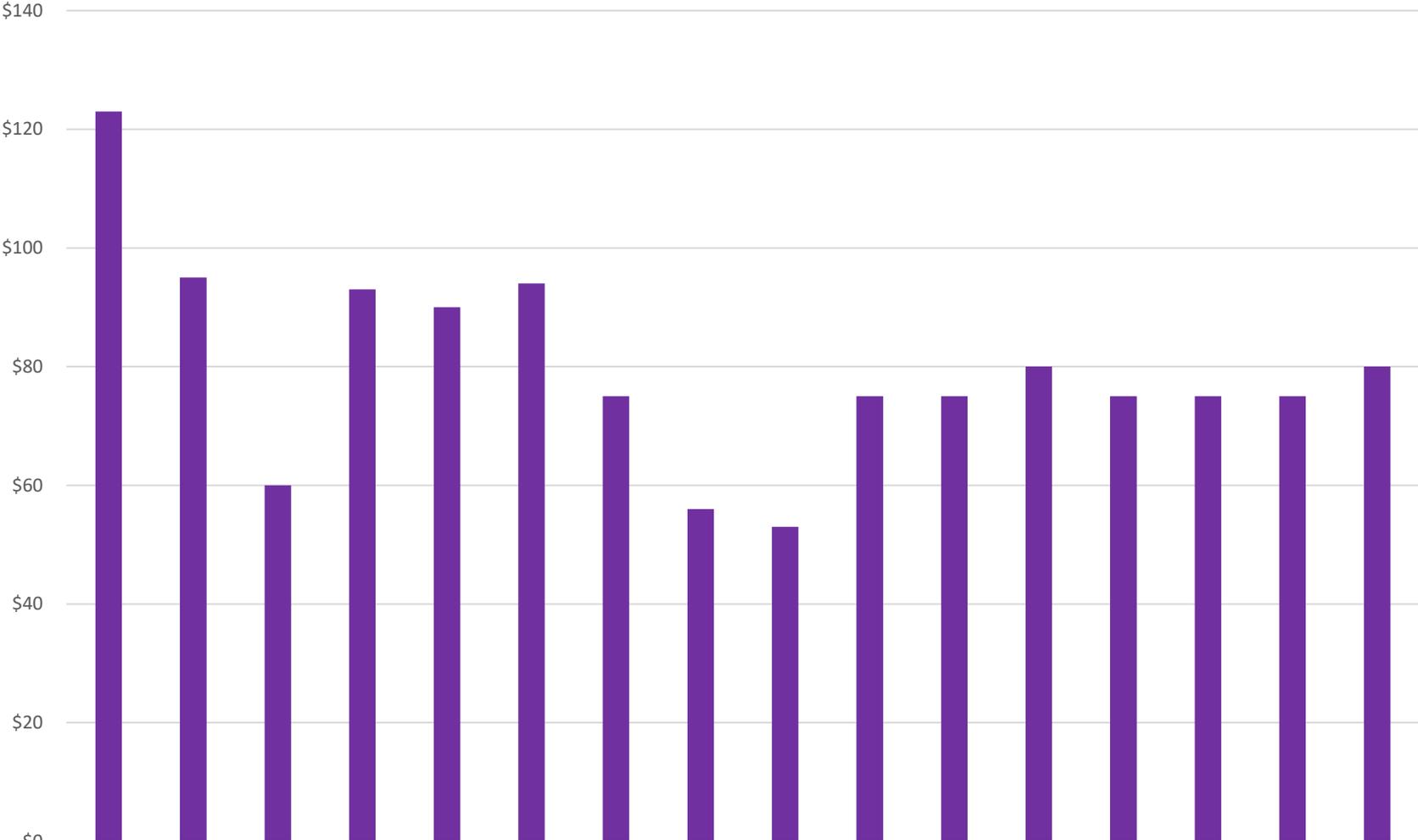
Flight Instruction Totals Comparison



Reg. + Instr. Total		\$262	\$170	\$258	\$251	\$268	\$240	\$174	\$224	\$222	\$225	\$265	\$245	\$240	\$200	\$215
G100 + Instr. Total	\$273	\$280		\$278	\$286	\$280						\$265				\$245

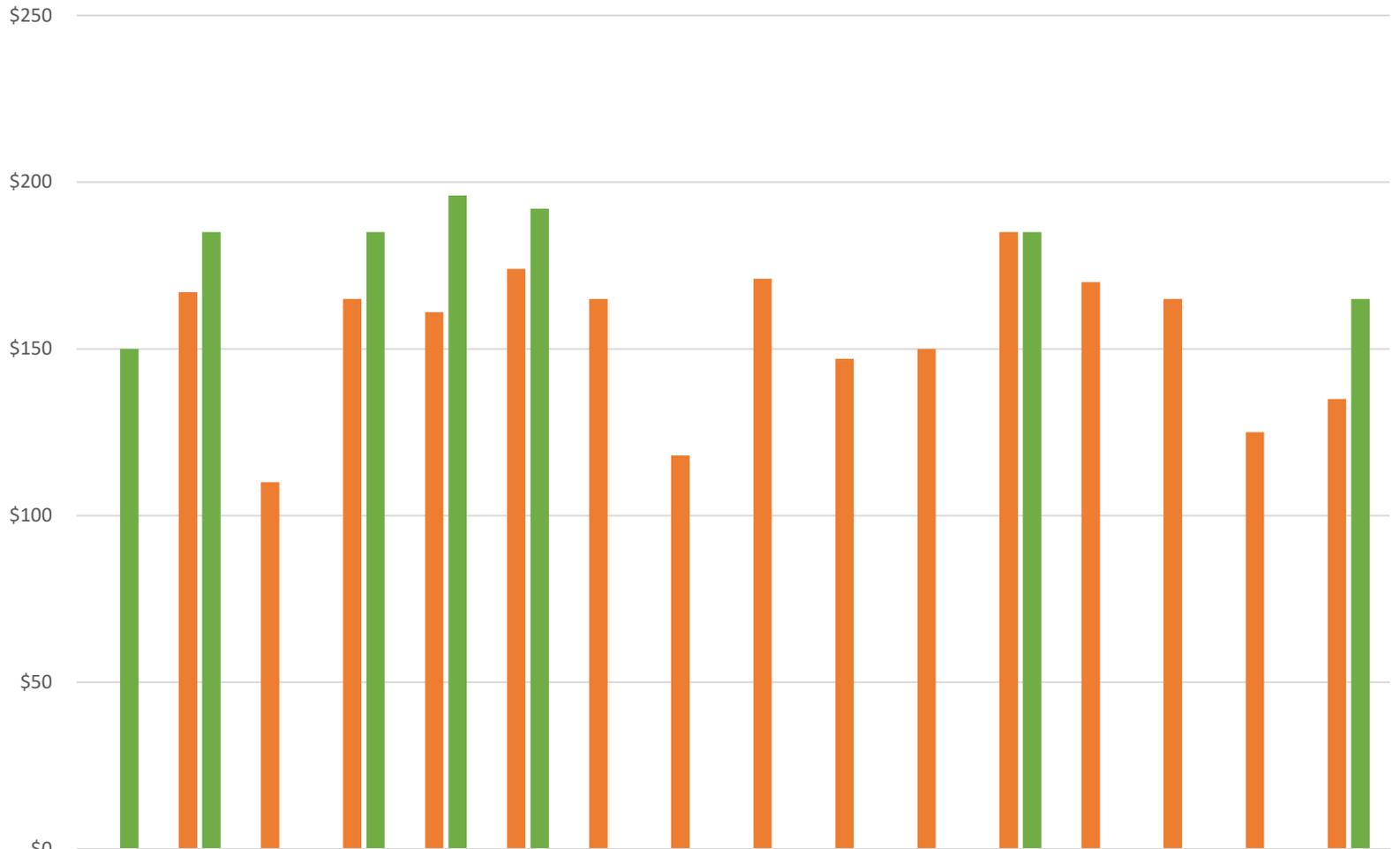
■ Reg. + Instr. Total
 ■ G100 + Instr. Total

Average Instructor Rates



■ Avg. Instructor Rate	\$123	\$95	\$60	\$93	\$90	\$94	\$75	\$56	\$53	\$75	\$75	\$80	\$75	\$75	\$75	\$80
	Truckee Airport	Santa Monica Flyers	Reid Hillview - Aerodynamic Aviation	Reid Hillview - Tradewinds Aviation	Palo Alto - Advantage Aviation	San Carlos Flight Center	Livermore - Attitude Aviation	Livermore - Red Sky Aviation	Sacramento Exec. - Fly CFI	Auburn - Mach 5 Aviation	Auburn - Sunshine Flyers	Reno - Great Basin Aviation	Minden - High Sierra Pilots	San Diego - Coast Flight	San Diego - Learn to Fly San Diego	Van Nuys - Corsair Aviation

Average Cessna 172 Rates



■ Avg. Cessna 172 Rate Wet		\$167	\$110	\$165	\$161	\$174	\$165	\$118	\$171	\$147	\$150	\$185	\$170	\$165	\$125	\$135
■ Avg. Cessna 172 G1000 Rate Wet	\$150	\$185		\$185	\$196	\$192						\$185				\$165

■ Avg. Cessna 172 Rate Wet ■ Avg. Cessna 172 G1000 Rate Wet

AIRCRAFT LEASEBACK AGREEMENT

This Agreement is entered into this _____ day of _____, 2018, between Truckee Tahoe Airport District, a California Airport District, hereinafter called "TTAD" and Sierra Aero, LLC, hereinafter called "SIERRA AERO."

WHEREAS, TTAD is purchasing an aircraft and wishes to make it available for use to the public for training purposes and to reduce noise and annoyance; and

WHEREAS, the aircraft TTAD is acquiring is a Cessna 172 JTA, which has a noise footprint that is significantly less than a gasoline-powered Cessna 172 and also has a better climb rate than a gasoline powered Cessna 172, resulting in shorter periods of climb and emitting less noise, and

WHEREAS, the Truckee Tahoe Airport is located in a noise-sensitive areas, and

WHEREAS, certain areas near the airport can be adversely affected by repeated touch and goes, and

WHEREAS, SIERRA AERO has a physical presence at the Truckee Tahoe Airport and conducts flight training, which includes significant touch and goes, which are necessary for appropriate flight training and proficiency,

NOW, THEREFORE, in consideration of the mutual promises and conditions expressed herein, the parties agree as follows:

1. Aircraft. TTAD will purchase and make available on the terms herein set forth, the following described aircraft (the "Aircraft"):

Manufacturer of Aircraft: Cessna 172 JTA

Model: Serial number: _____

FAA Registration No.: _____

Engine Make: 155 HP Continental CD-155 Diesel

2. Term. The term of this Agreement shall begin ten business days after the Aircraft arrives at the Truckee Tahoe Airport so to allow inspection and familiarization. Either party may terminate this Agreement by giving the other party thirty (30) days written notice.
3. A. Fees for Aircraft Use. Sierra Aero shall charge an hourly rental fee that is the same as other Cessna 172's and on the same terms and conditions that it rents. That rate is currently \$150 per hour, "wet". The parties shall meet and confer any time Sierra Aero intends to change the hourly rental fee. If the parties cannot agree on a rental fee modification, they shall participate in mediation with the American Arbitration Association in Sacramento or Truckee, or with any other mediator upon which the parties agree. Such agreement to change the hourly rate shall include a possible modification to the Commission described in paragraph 4, below. SIERRA AERO will make efforts to promote the use of the Aircraft to the public. SIERRA AERO will act as a collection agent for the TTAD of all fees paid for use of the Aircraft. These fees will be turned over to the TTAD on a monthly basis less any commissions due to SIERRA AERO in accordance with paragraph 4, below.

B. Because the purpose of this Agreement is to reduce noise and annoyance from touch and goes at the Truckee Tahoe Airport, SIERRA AERO agrees to do everything possible to encourage flight instructors, students, and pilots to utilize this aircraft for training and currency touch and go operations. This Aircraft shall be the primary aircraft utilized for touch and goes at the Truckee Tahoe Airport. However, the District recognizes that other aircraft in SIERRA AERO's fleet may also be used for touch and goes due to scheduling and maintenance issues and that the Aircraft will also be used for flights away from the Truckee Tahoe Airport for training and rental purposes.

C. It is the intent of SIERRA AERO to remove either N1968F or N9110H from the SIERRA AERO Rental Fleet and replace such rental aircraft with the TTAD Cessna 172 JT-A. If at a future date and per the terms of the SIERRA AERO Lease Agreement with TTAD, SIERRA AERO adds additional rental aircraft, SIERRA AERO agrees to inform TTAD 30 days in advance of placing additional aircraft into the SIERRA AERO Rental Fleet.

4. Commission. For each hour flown in the Aircraft as recorded on a Hobbs, SIERRA AERO shall pay to TTAD the sum of \$90.00. TTAD shall have the right to inspect SIERRA AERO's records for the Aircraft at any reasonable time and upon 24 hours' advance notice.
5. Operation.

Scheduling. The SIERRA AERO will maintain a schedule book for Aircraft use on the SIERRA AERO's premises.

Aircraft Base. The Aircraft will be permanently based at Truckee Tahoe Airport.

TTAD Use. TTAD shall retain the right to also utilize the aircraft, with no greater scheduling priority than the public. However, TTAD shall not be obligated to pay any rental fee for its use of the aircraft.

Limits of Aircraft Use:

- a. The Aircraft is not to be operated beyond the continental limits of the United States, nor shall it be flown more than 300 statute miles from the Truckee Tahoe Airport.
- b. Except for either Private Pilot Night Training or the Commercial Pilot Night Cross Country Requirement during Daylight Savings Time, in which case the aircraft must be returned prior to 11:00 p.m., the aircraft shall not be operated (including taxi and run-up), between the hours of 10:00 p.m. and 7:00 a.m. (local time).
- c. Except as required for weather, other aircraft, fowl or emergency, the aircraft shall at all times be flown in accordance with the TTAD's Noise Abatement Procedures.
- d. The Aircraft shall not be used for commercial flights (other than flight training). No charter operations are permitted.
- e. The aircraft shall not be scheduled for any overnight use.
- f. The Aircraft shall not be used for any illegal purpose.

Permitted Aircraft Use. The Aircraft will be made available only for the purposes of:

- a. Personal travel and/or business travel by the pilot in command.
- b. Flight training.

c. Demonstration.

Aircraft Accidents. Accidents shall be reported promptly to the TTAD, and the TTAD and SIERRA AERO shall jointly file all necessary reports with the FAA and the NTSB.

6. *TTAD Ownership.* It is clearly understood that title to the Aircraft shall at all times remain with the TTAD, and nothing herein shall authorize SIERRA AERO or any other person to incur any liability or obligation on behalf of the TTAD. Furthermore, TTAD warrants that it is the owner of the Aircraft and that it has the full right to execute this Agreement.
7. *Maintenance and Care.*

Fuel and Oil. TTAD shall be financially responsible for all fuel and oil for operation of the Aircraft.

Maintenance. TTAD, at TTAD's expense, shall maintain and keep in good order and repair the Aircraft. TTAD, in consultation with SIERRA AERO, shall arrange for, at TTAD's expense, all inspections, parts, labor, overhaul and all maintenance and repairs of or for the Aircraft during the term hereof. TTAD may arrange for service companies to perform such services. If TTAD utilizes SIERRA AERO for such inspection, maintenance or repairs, it shall be carried out separately from this Agreement. Maintenance, inspection and repairs shall be made by competent personnel and with proper fuel, oil and other parts in compliance with the operation and maintenance manuals for the Aircraft and with FAA rules and regulations, all under the control and direction of the TTAD.

Hangar. TTAD, at TTAD's expense, shall arrange for the hangaring of the Aircraft.

Fees. TTAD agrees to pay all license fees and other fees, taxes and assessments imposed by any government or municipality that may arise out of the ownership of the Aircraft except any sales tax if applicable, which SIERRA AERO will arrange to have charged to use as provided by the sales tax laws of the State of California.

TTAD's Liability. TTAD is and will remain responsible and liable for all damage, confiscation, destruction or loss to or of the Aircraft for any reason whatsoever, including loss of use or diminution in market value.

8. Insurance.

Hull Insurance and Waiver of Subrogation. SIERRA AERO will provide hull insurance for the aircraft in the amount of \$500,000 for the interest of TTAD, including but not limited to loss of use. TTAD shall be named as an additional named insured on that policy, which SIERRA AERO shall provide a copy to TTAD. Said policy shall provide that if it is cancelled or modified, TTAD shall be given written notice by that insurance company 30 days prior to any such cancellation or modification. TTAD shall reimburse SIERRA AERO the cost of insurance for the aircraft.

Insurance Proceeds. Proceeds from the insurance will be applied to the cost of repairs of the damage covered by insurance, but the user operating the aircraft when it was damaged will be responsible to TTAD for the deductible portion of the loss, if any.

Liability Insurance. Each party, TTAD and SIERRA AERO, at TTAD's expense, shall provide a minimum of \$ 1,000,000 combined single-limit legal liability insurance, including passengers', for user's protection.

9. *Notice of Cancellation.* The policies shall provide each party with at least twenty (30) days' notice in writing before termination, modification or cancellation of the policies.

10. *Operator Proficiency.* The Aircraft shall be operated only by pilots currently certificated and qualified to operate the Aircraft in compliance with the laws of the United States or any other state or local government authority having jurisdiction therefor, and in accordance with the provisions of the insurance policy or policies issued in connection therewith.

11. *Default.* In the event of any breach or default of this Agreement by SIERRA AERO, this Agreement may be terminated immediately by written notice to SIERRA AERO.

12. *Entire Agreement.* This Agreement constitutes the entire agreement between the parties. No statements, promises, or inducements made by any party to this Agreement, or any agent or employees of either party, which are not contained in this written contract shall be valid or binding. This Agreement may not be enlarged, modified, or altered except in writing signed by the parties.

- 13. Waiver. Either party's failure to enforce any provision of this Agreement against the other party shall not be construed as a waiver thereof so as to excuse the other party from future performance of that provision or any other provision.
- 14. Assignment. This Agreement may not be transferred or assigned without a written authorization signed by TTAD and SIERRA AERO.
- 15. Severability. The invalidity of any portion of this Agreement shall not affect the validity of the remaining portions thereof.
- 16. Paragraph Headings. The headings to the paragraphs to this Agreement are solely for convenience and have no substantive effect on the Agreement nor are they to aid in the interpretation of the Agreement.
- 17. Governing Law. This Agreement is a contract executed under and to be construed under the laws of the State of California. Both parties consent to submit any disputes related to this Agreement to the jurisdiction of the Superior Court of California, County of Nevada, Truckee Branch.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first above written.

TTAD, by:

SIERRA AERO, by:

Rick Stephens, Board President

Name:

Title:

Kevin Smith, General Manager

Name:

Brent P. Collinson, District Counsel

Its Counsel



TRUCKEE TAHOE AIRPORT DISTRICT BOARD OF DIRECTOR STAFF REPORT

AGENDA TITLE: Cessna 172 JT-A Diesel Aircraft Sound Test Results and Discussion of Aircraft Acquisition

MEETING DATE: November 29, 2017

PREPARED BY: Hardy Bullock, Director of Aviation & Community Services

RECOMMENDED ACTION: Review the attached report and discuss the Cessna JT-A aircraft noise test results. Provide direction to Staff following discussion or action steps.

DISCUSSION: In an effort to reduce annoyance from repetitive aircraft operations, (touch and go's) staff investigated the emerging diesel aircraft platform as a potential solution. In 2015 the Board and Staff tested a diesel retro fit Red Bird Skyhawk 172. The results showed dramatic reductions in noise at every phase of flight. That report is attached herein for your review (HMMH REDBIRD). Cessna Aircraft has recently debuted a certified, factory built Cessna Skyhawk with a diesel engine. The aircraft is not modified, it is a new certificated general aviation aircraft suitable for training and cross country flight in both IFR and VFR conditions including night flight.

Based on direction from the Board, staff conducted a noise and flight test of this Cessna JT-A aircraft on October 6th using HMMH Noise Consultants. The airborne noise test and static tests used identical methodology to the 2015 Red Bird flight test including the same locally based Cessna Skyhawk training aircraft N1968F. The report dated November 13, 2017 is attached for your review. The test also consisted of flight testing the aircraft by several local pilots. The flight test yielded some interesting results. Of the three aircraft flown the Cessna JT-A provided the best flight experience from a pilot perspective. The new aircraft obviously is equipped better with a full glass Garmin G1000 panel and flies like a new aircraft. The diesel engine produces 155 horsepower constantly turbo normalized so the engine is only slightly affected by altitude and air density. The power band is more consistent as there is no significant loss of horsepower in the climb. The rate of climb is similar to a Cessna Skylane with a 235 horsepower engine although

much smoother and quieter. On a standard temperature day the rate of climb with three people in the aircraft was nearly 900 feet per minute off the runway. The reduction of emissions is considerable as the aircraft only burns about 6-8 gallons of jet fuel per hour. In summary the aircraft performed very well at Truckee and its performance mimicked that of a Cessna Skylane 182. The aircraft climbed faster thus realizing an earlier power reduction with a commensurate noise duration reduction. The aircraft burns less fuel and has a smoother, quieter power band through the altitude changes reaching cruise flight. Its performance in high density altitude conditions common to Truckee in the summer would be significant based on the turbo normalized diesel.

From a noise perspective the JT-A aircraft was significantly quieter than the standard Cessna 172 Skyhawk (N1968F) in the overflight phase. Decibel is a logarithmic measurement of total sound energy. 2 db is perceptible to the human ear, 3 db is noticeable, 6 db, measured by the human ear is roughly half as loud when compared to the baseline for this type of measurement. The JT-A aircraft was not quieter than N1968F during the 2017 static run-up test. This was puzzling and detailed discussions with HMMH did not yield any answers. The JT-A aircraft was noticeably quieter while taxiing on the ramp. The noise test was inconsistent between 2015 and 2017. Many variables contribute to this, temperature, flight path, wind, pilot, aircraft position, loading etc. In summary HMMH is confident that the JT-A aircraft is around 6 db quieter while flying over neighborhoods adjacent to the airport which will be about 50% quieter to the human ear. The run-up noise from the JT-A is about the same as N1968F. The JT-A climbs faster and has a shorter noise duration as power reductions for landing can be achieved sooner; this reduces noise to the surrounding neighborhoods.

Staff, along with HMMH has concluded the Cessna JT-A diesel aircraft will be noticeably quieter while making repeat operations at Truckee Tahoe airport. This is by design and also a function of increased vertical performance allowing shorter durations of single event noise as power may be reduced sooner as compared to the current training aircraft N1968F. The total acquisition cost of the aircraft, the anticipated rental revenue, and all the associated variable cost are outlined in the attached pro-forma. The lease back concept would allow Sierra Aero to effectively manage the aircraft for instruction and rental purposes while removing one standard Cessna Skyhawk from their available fleet. Provisions within the leaseback agreement would outline acceptable pilot conduct including compliance with all noise abatement procedures, curfews, and routes. The available revenue after cost will be returned to the District. The reductions in community annoyance would be subsidized at a rate equal to the net operating revenue which will be negative over the ten year term. Again, the Board is not expected to make a financial decision immediately. This report is useful for planning purposes and is designed to give the Board and Staff some planning direction on next steps.

WHAT'S NEXT: Direct Staff to bring forward final financial pro-forma supporting material and sample lease back agreements to Sierra Aero. Alternatively direct Staff on potential next steps if any.

FISCAL IMPACT: Potentially significant. Total cost is approximately \$515,000 for aircraft acquisition including sales tax, licensing, etc. Per the proforma, the aircraft generates revenue to offset a portion of these costs. The aircraft is a tangible asset which could be sold if the program is deemed unsuccessful recovering a significant portion of the initial acquisition costs. Funding is budgeted in the CY2018 Budget.

PUBLIC COMMUNICATIONS: Staff announced the test to all the surrounding neighborhoods within the regular media channels. Additional communications to the flight instructor community took place by phone. Additional outreach efforts included multiple discussions and noticed public Board meetings.

SAMPLE MOTION(S): Discussion item only

ATTACHMENTS:

KTRK – Turbo Skyhawk – Proforma

HMMH REDBIRD

Skyhawk_JTA_ProductCard

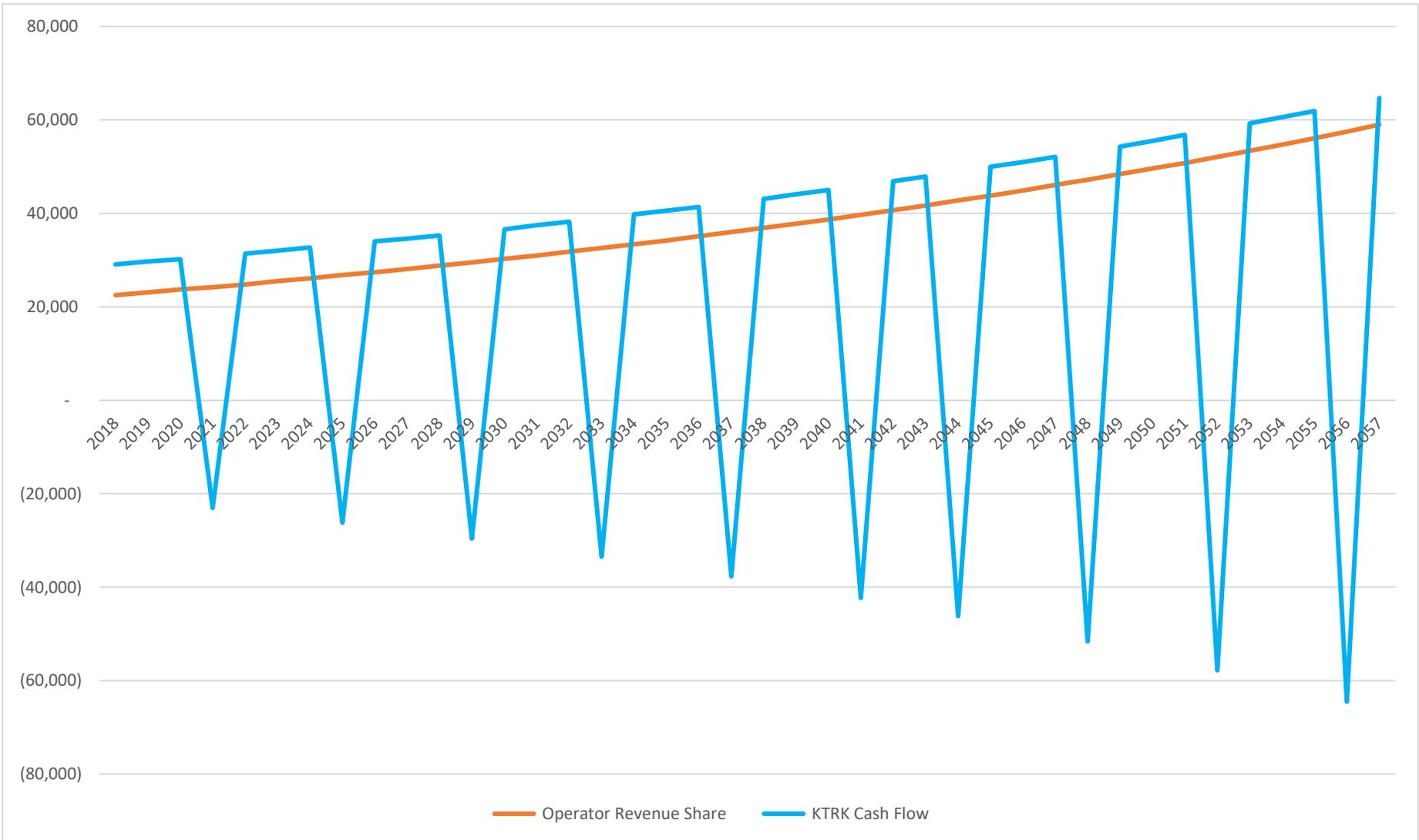
TRK_AircraftNoiseComparisonResultMemorandum_Final

Truckee Tahoe Airport District
Cessna 172JT-A - Turbo Skyhawk
Financial Proforma - Results & Assumptions
9/19/17

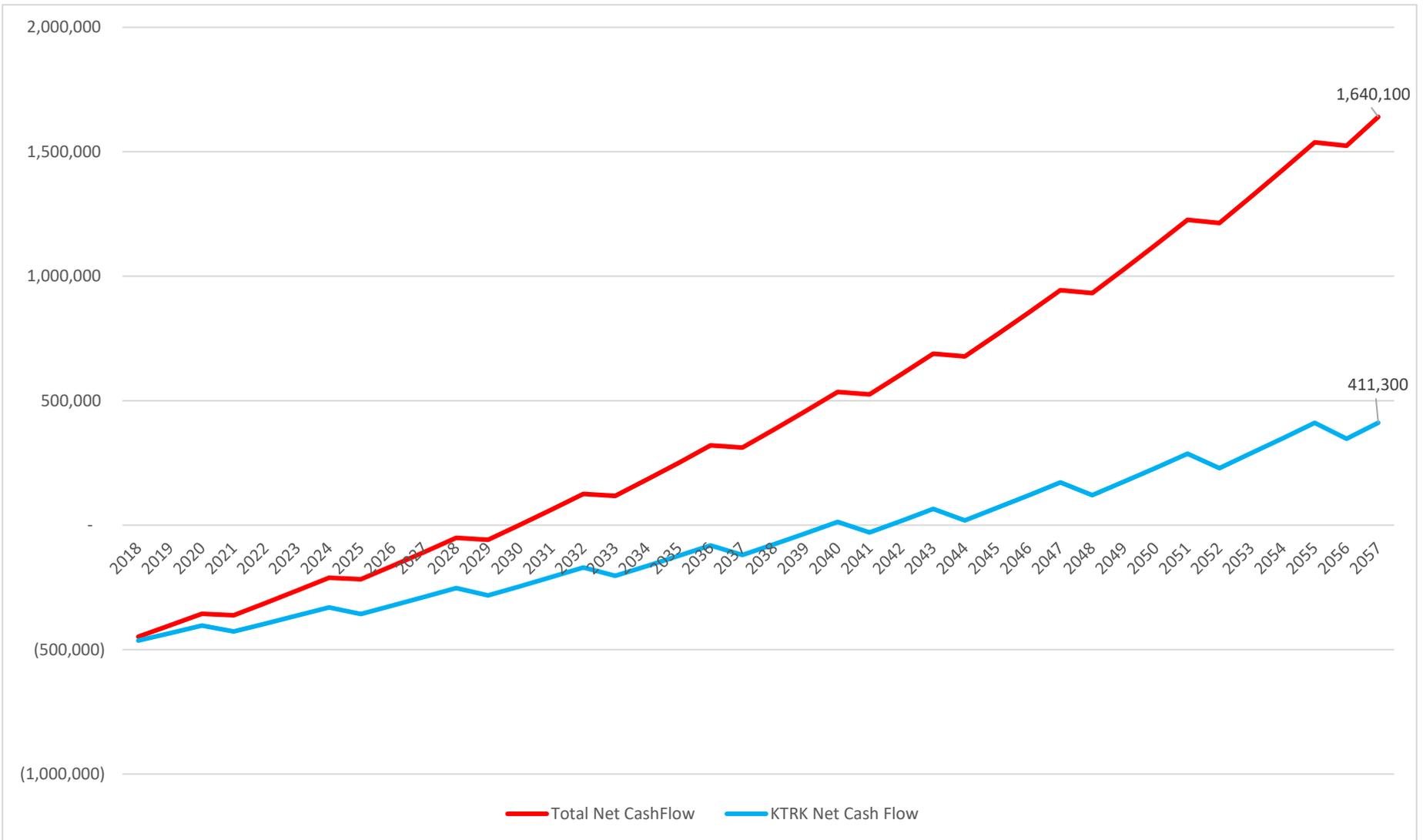
Results					
	2018-2027	2028-2037	2038-2047	2048-2057	Total
<u>Total Net Cash Flow</u>					
Revenue	1,008,400	1,290,700	1,652,300	2,115,000	6,066,400
Expenditures					
Acquisition Cost	492,600	-	-	-	492,600
Operations	342,200	438,300	561,100	718,000	2,059,600
Maintenance	281,500	433,100	458,500	701,000	1,874,100
Total Expenditures	1,116,300	871,400	1,019,600	1,419,000	4,426,300
Total Net Cash Flow	(107,900)	419,300	632,700	696,000	1,640,100
<u>KTRK Cash Flow</u>					
Total Net Cash Flow	(107,900)	419,300	632,700	696,000	1,640,100
Operator Share	25.00%	(252,200)	(322,700)	(528,800)	(1,516,800)
Fuel Gross Margin		72,000	72,000	72,000	288,000
Net KTRK Cash Flow		(288,100)	168,600	239,200	411,300
Payback Period (Break-Even)					2040

Assumptions					
Revenue					
Rate / Hour		150			
Hours / Year		600			
Inflation Factor		2.50%			
Revenue Split		25.00%			
Expenditures					
Acquisition Cost					
Purchase Price		435,000			
Sales Tax	7.50%	32,600			
Upfit & Contingency		25,000			
Total Acquisition Cost		492,600			
Operations					
Gallons / Hour		6		need verification	
Fuel \$ / Gallon		5.00		Jet A or Diesel	
Fuel \$ Gross Margin / Gallon		2.00		Recovered by KTRK	
Storage / Month		380			
Insurance / Year		8,000			
Operations					
100 Hour Inspection - Cost		2,500			
Engine & Prop Replacement - Cost		50,000			
Engine & Prop Replacement - Hours		2,300			

**Truckee Tahoe Airport District
Cessna 172JT-A - Turbo Skyhawk
Annual Cash Flow - After Acquisition
9/19/2017**



**Truckee Tahoe Airport District
Cessna 172JT-A - Turbo Skyhawk
Cumulative Cash Flow
9/19/2017**



**Truckee Tahoe Airport District
Cessna 172JT-A - Turbo Skyhawk
Sensitivity Tables - Rental Rate & Hours/Year - 40 Year Return
9/19/2017**

Total Net Cash Flow

Rental Rate and Hours/Year Sensitivity - 40 Year Return

		Rental Rate / Hour						
		150	155	160	165	170	175	180
Hours / Year	500	1,180,400	1,348,600	1,517,500	1,685,800	1,854,200	2,022,600	2,191,400
	550	1,410,800	1,596,600	1,781,400	1,966,700	2,151,900	2,337,500	2,522,700
	600	1,640,100	1,842,000	2,044,400	2,246,400	2,448,800	2,651,200	2,853,000
	650	1,870,700	2,089,800	2,308,500	2,527,600	2,746,500	2,966,000	3,184,900
	700	2,097,600	2,333,300	2,569,100	2,804,900	3,040,700	3,277,100	3,512,800
	750	2,329,200	2,581,800	2,834,600	3,087,200	3,340,100	3,592,600	3,845,600
	800	2,690,600	2,960,300	3,229,700	3,499,300	3,769,000	4,038,400	4,308,200

KTRK Net Cash Flow

Rental Rate and Hours/Year Sensitivity - 40 Year Return

		Rental Rate / Hour						
		150	155	160	165	170	175	180
Hours / Year	500	156,400	281,900	408,900	535,000	661,400	787,500	914,600
	550	284,000	423,500	562,100	701,000	839,900	979,400	1,118,000
	600	411,300	562,500	714,400	865,700	1,017,400	1,169,100	1,320,700
	650	539,100	703,400	867,600	1,032,100	1,196,000	1,360,500	1,525,000
	700	663,500	840,400	1,017,200	1,194,300	1,370,900	1,548,200	1,725,300
	750	793,000	982,500	1,171,800	1,361,300	1,551,100	1,740,700	1,929,900
	800	1,051,800	1,254,300	1,456,500	1,658,800	1,861,300	2,062,600	2,265,300

Truckee Tahoe Airport District Cessna 172JT-A - Turbo Skyhawk Sensitivity Tables - Rental Rate & Operator Share - 40 Year Return 9/19/2017

Total Net Cash Flow

Rental Rate and Operator Share Sensitivity - 40 Year Return

		Rental Rate / Hour						
		150	155	160	165	170	175	180
Operator Share	22%	1,640,100	1,842,000	2,044,400	2,246,400	2,448,800	2,651,200	2,853,000
	23%	1,640,100	1,842,000	2,044,400	2,246,400	2,448,800	2,651,200	2,853,000
	24%	1,640,100	1,842,000	2,044,400	2,246,400	2,448,800	2,651,200	2,853,000
	25%	1,640,100	1,842,000	2,044,400	2,246,400	2,448,800	2,651,200	2,853,000
	26%	1,640,100	1,842,000	2,044,400	2,246,400	2,448,800	2,651,200	2,853,000
	27%	1,640,100	1,842,000	2,044,400	2,246,400	2,448,800	2,651,200	2,853,000
	28%	1,640,100	1,842,000	2,044,400	2,246,400	2,448,800	2,651,200	2,853,000
	29%	1,640,100	1,842,000	2,044,400	2,246,400	2,448,800	2,651,200	2,853,000
	30%	1,640,100	1,842,000	2,044,400	2,246,400	2,448,800	2,651,200	2,853,000

KTRK Net Cash Flow

Rental Rate and Operator Share Sensitivity - 40 Year Return

		Rental Rate / Hour						
		150	155	160	165	170	175	180
Operator Share	22%	593,600	751,100	908,900	1,066,400	1,224,300	1,382,100	1,539,700
	23%	533,100	688,200	844,000	999,800	1,155,400	1,311,300	1,467,100
	24%	472,100	625,500	779,200	933,000	1,087,000	1,240,700	1,394,600
	25%	411,300	562,500	714,400	865,700	1,017,400	1,169,100	1,320,700
	26%	350,700	500,200	649,900	799,600	949,100	1,098,900	1,248,000
	27%	290,100	437,800	585,600	732,600	880,600	1,028,100	1,175,400
	28%	229,500	374,900	520,600	665,900	811,800	957,300	1,102,300
	29%	169,000	312,200	456,200	599,500	743,300	886,500	1,030,200
	30%	108,000	249,400	391,000	532,400	674,300	816,100	956,700

Truckee Tahoe Airport District Cessna 172JT-A - Turbo Skyhawk Sensitivity Tables - Hours/Year & Operator Share - 40 Year Return 9/19/2017

Total Net Cash Flow

Hours/Year and Operator Share Sensitivity - 40 Year Return

		Hours / Year						
		500	550	600	650	700	750	800
Operator Share	22%	1,180,400	1,410,800	1,640,100	1,870,700	2,097,600	2,329,200	2,690,600
	23%	1,180,400	1,410,800	1,640,100	1,870,700	2,097,600	2,329,200	2,690,600
	24%	1,180,400	1,410,800	1,640,100	1,870,700	2,097,600	2,329,200	2,690,600
	25%	1,180,400	1,410,800	1,640,100	1,870,700	2,097,600	2,329,200	2,690,600
	26%	1,180,400	1,410,800	1,640,100	1,870,700	2,097,600	2,329,200	2,690,600
	27%	1,180,400	1,410,800	1,640,100	1,870,700	2,097,600	2,329,200	2,690,600
	28%	1,180,400	1,410,800	1,640,100	1,870,700	2,097,600	2,329,200	2,690,600
	29%	1,180,400	1,410,800	1,640,100	1,870,700	2,097,600	2,329,200	2,690,600
	30%	1,180,400	1,410,800	1,640,100	1,870,700	2,097,600	2,329,200	2,690,600

KTRK Net Cash Flow

Hours/Year and Operator Share Sensitivity - 40 Year Return

		Hours / Year						
		500	550	600	650	700	750	800
Operator Share	22%	308,400	451,400	593,600	736,800	876,500	1,021,000	1,294,900
	23%	257,600	395,500	533,100	671,000	805,700	944,800	1,214,500
	24%	206,800	340,300	472,100	605,400	735,100	869,200	1,133,400
	25%	156,400	284,000	411,300	539,100	663,500	793,000	1,051,800
	26%	105,900	228,500	350,700	473,800	593,300	717,700	971,300
	27%	55,300	173,500	290,100	408,300	522,500	642,000	890,400
	28%	4,700	117,800	229,500	342,200	451,700	566,400	810,000
	29%	(45,500)	61,900	169,000	276,500	380,900	490,400	728,900
	30%	(96,300)	6,500	108,000	211,100	310,500	413,700	647,800

**Truckee Tahoe Airport District
Cessna 172JT-A - Turbo Skyhawk
Financial Proforma - Summary
9/19/17**

	1 2018	2 2019	3 2020	4 2021	5 2022	6 2023	7 2024	8 2025	9 2026	10 2027	1-10 2018-2027	11 2028-2037	12 2038-2047	13 2048-2057	Total
Revenue															
Rate / Hour	150	150	150	150	150	150	150	150	150	150	150	150	150	150	
Hours	600	600	600	600	600	600	600	600	600	600	6,000	6,000	6,000	6,000	24,000
Revenue before inflation	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	900,000	900,000	900,000	900,000	3,600,000
Inflation Factor	2.50% 100.00%	102.50%	105.06%	107.69%	110.38%	113.14%	115.97%	118.87%	121.84%	124.89%	112.04%	143.41%	183.59%	235.00%	
Total Revenue	90,000	92,300	94,600	96,900	99,300	101,800	104,400	107,000	109,700	112,400	1,008,400	1,290,700	1,652,300	2,115,000	6,066,400
Expenditures															
Acquisition Cost	492,600	-	-	-	-	-	-	-	-	-	492,600	-	-	-	492,600
Operations															
Fuel															
Hours / Year	600	600	600	600	600	600	600	600	600	600	6,000	6,000	6,000	6,000	24,000
Rate / Hour	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
Total Gallons / Year	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	36,000	36,000	36,000	36,000	144,000
Fuel \$ / Gallon	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	
Total Fuel Cost	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	180,000	180,000	180,000	180,000	720,000
Storage	4,560	4,560	4,560	4,560	4,560	4,560	4,560	4,560	4,560	4,560	45,600	45,600	45,600	45,600	182,400
Insurance	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	80,000	80,000	80,000	80,000	320,000
Total Operations	30,560	30,560	30,560	30,560	30,560	30,560	30,560	30,560	30,560	30,560	305,600	305,600	305,600	305,600	1,222,400
Maintenance															
Annual Maintenance															
100 Hour Inspection - Cost	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	
100 Hour Inspections	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	60.00	60.00	60.00	60.00	240.00
Annual Maintenance	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	150,000	150,000	150,000	150,000	600,000
Engine & Prop Replacement															
Engine & Prop Replacement - Cost	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
Engine & Prop Replacements	-	-	-	1	-	-	-	1	-	-	2	3	2	3	12
Engine & Prop Replacement - Cost	-	-	-	50,000	-	-	-	50,000	-	-	100,000	150,000	100,000	150,000	500,000
Total Maintenance	15,000	15,000	15,000	65,000	15,000	15,000	15,000	65,000	15,000	15,000	250,000	300,000	250,000	300,000	1,350,000
Total Cost	538,160	45,560	45,560	95,560	45,560	45,560	45,560	95,560	45,560	45,560	1,048,200	605,600	555,600	605,600	3,863,200
Inflation Factor	100.00%	102.50%	105.06%	107.69%	110.38%	113.14%	115.97%	118.87%	121.84%	124.89%	112.04%	143.41%	183.59%	235.00%	
Total Cost after Inflation	538,200	46,700	47,900	102,900	50,300	51,500	52,800	113,600	55,500	56,900	1,116,300	871,400	1,019,600	1,419,000	4,426,300
Total Net Cash Flow	(448,200)	45,600	46,700	(6,000)	49,000	50,300	51,600	(6,600)	54,200	55,500	(107,900)	419,300	632,700	696,000	1,640,100
<u>KTRK Net Cash Flow</u>															
Total Net Cash Flow	(448,200)	45,600	46,700	(6,000)	49,000	50,300	51,600	(6,600)	54,200	55,500	(107,900)	419,300	632,700	696,000	1,640,100
Operator Share	(22,500)	(23,100)	(23,700)	(24,200)	(24,800)	(25,500)	(26,100)	(26,800)	(27,400)	(28,100)	(252,200)	(322,700)	(413,100)	(528,800)	(1,516,800)
Fuel Gross Margin	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	72,000	72,000	72,000	72,000	288,000
KTRK Net Cash Flow	(463,500)	29,700	30,200	(23,000)	31,400	32,000	32,700	(26,200)	34,000	34,600	(288,100)	168,600	291,600	239,200	411,300

HMMH

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MEMORANDUM

To: Hardy S. Bullock
Director of Aviation & Community Services
Truckee Tahoe Airport District
10356 Truckee Airport Rd.
Truckee, CA 96160

From: Rhea A. Gundry
Senior Consultant

Date: July 9, 2015

Subject: Measured Aircraft Noise Comparison

Reference: HMMH Job No.307560.000



HMMH assisted Truckee Tahoe Airport (TRK) to compare noise levels of two, fixed wing single-engine aircraft: (1) A standard Cessna 172N (N1968F) that is based at TRK and (2) A RedHawk Cessna 172P (N64686) with a retrofitted Jet A diesel engine and smaller diameter three bladed propeller. TRK arranged for the RedHawk to fly in from Texas for a side by side comparison of these nearly identical aircraft to demonstrate the difference in noise level with the retrofitted diesel engine.

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This memorandum provides the results of the noise measurements conducted on June 24, 2015 at TRK and in the nearby surrounding community.

HMMH deployed four (4) Rion 22 noise meters on the airfield and in the community to obtain the A-weighted one-second time history noise levels in decibels (dB). Figure 1 shows the locations of each monitoring site and the flight tracks. Observers were stationed with the noise meters to listen and record each flyover event. Using the observer logs and recorded time histories, HMMH calculated the Single Event Noise Exposure Level (SENEL), which is also known as the Sound Exposure Level (SEL), for each of the demonstration aircraft noise events captured by the noise meters.

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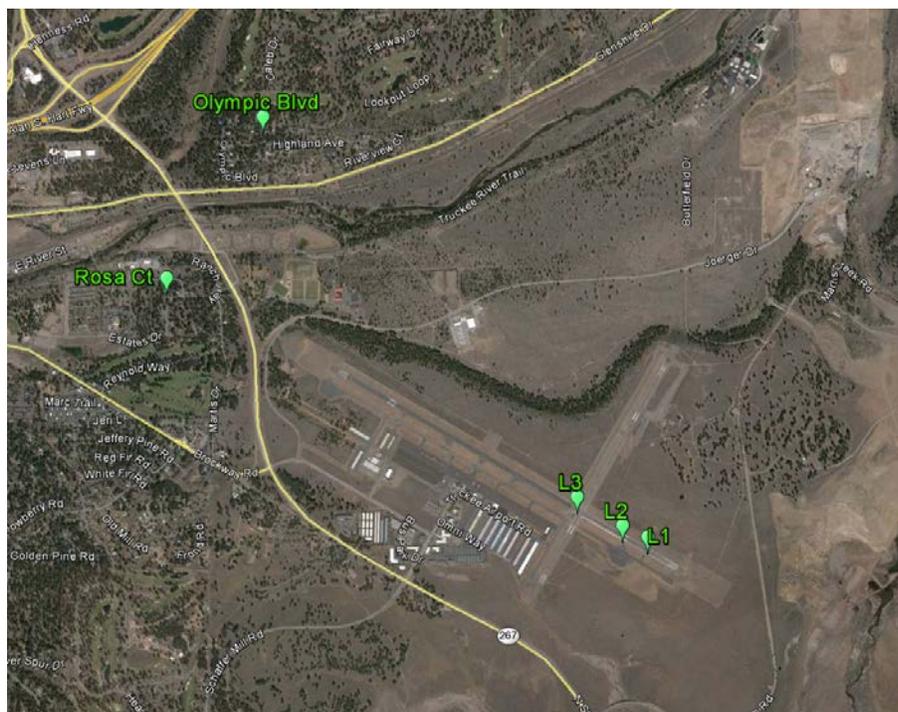


Figure 1 Noise Monitoring Sites

Three TRK airfield locations along the runway sideline (L1-L3) were measured to capture the difference between four unique elements of an aircraft departure, touch-and-go procedure, and arrival:

- L1) Start of takeoff roll
- L2) Engine rev 1000' down the runway of a touch-and-go procedure
- L3) 1) Touch-and-go procedure at rotation and
 2) Touch down and final taxi on taxiway G

Table 1 shows the measured noise levels of both aircraft for each of the above identified aircraft events and the noise level difference between the standard aircraft and the retrofitted (RedHawk) aircraft. The RedHawk, with the retrofitted diesel engine, is approximately 8 dB quieter than the standard (non-retrofitted aircraft) on the airfield. The arrival event, touchdown and final taxi, is the exception with the RedHawk only 2 dB quieter.

Table 1: Noise Levels from Aircraft Operations as Measured on the TRK Airfield			
Event	Standard	RedHawk	Difference
L1	98.6	90.1	-8.5
L2	90.9	82.8	-8.0

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L3-1	94.6	85.8	-8.8
L3-2	72.8	70.5	-2.3

Note: Noise levels presented herein are A-weighted SENEL in dB

Table 2 and Table 3 show the noise level results for each demonstration aircraft event measured at each community location and the average noise level of all demonstration aircraft events. While the aircraft operations of each aircraft were not completely identical, the pilots attempted to maintain similar aircraft path, altitude and weight for the standard aircraft and the RedHawk. On average the RedHawk is 5 to 10 dB quieter than the standard aircraft, which is in the range of a perception of being "half as loud".

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Table 2: Noise Levels from Aircraft Operations as Measured at Rosa Ct.			
Event	Standard	RedHawk	Difference
E1	78.6	71.2	-7.4
E2	79.0	70.4	-8.7
E3	81.4	78.2	-3.1
Average	79.8	74.8	-5.1

Note: Noise levels presented herein are A-weighted SENEL in dB

Table 3: Noise Levels from Aircraft Operations as Measured at Olympic Blvd.			
Event	Standard	RedHawk	Difference
E1	82.1	72.2	-9.9
E2	83.3	71.9	-11.5
E3	81.3	71.9	-9.4
Average	82.3	72.0	-10.3

Note: Noise levels presented herein are A-weighted SENEL in dB

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Using the same Rion noise meters and collecting one-second noise level time histories, HMMH calculated the equivalent sound level, Leq, of a full power run-up at 20 degree increments, 30 feet from each engine. Leq is the equivalent sound level measured throughout the noise event as though the sound level was constant throughout the event. Figure 2 shows a side by side comparison of the directivities of each aircraft in terms of the Leq noise metric.

HMMH

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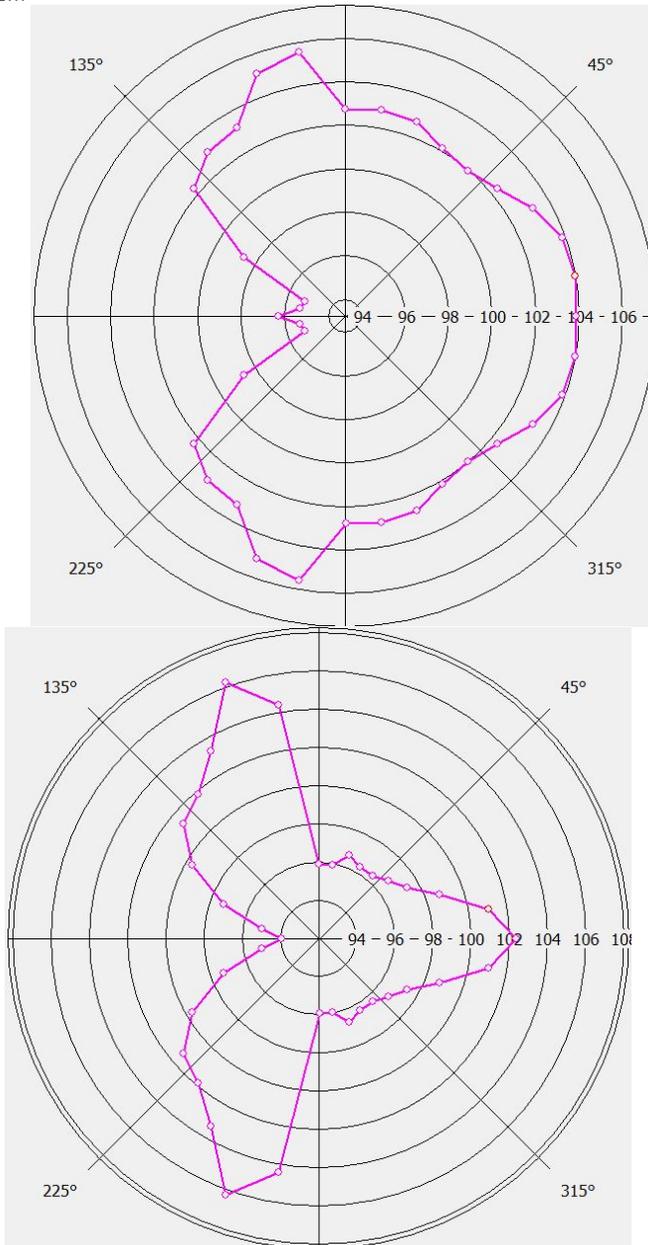


Figure 2 Directivity of 1968F (top) and RedHawk (bottom)

Note: Engine at center, nose/propeller of plane facing 0°

HMMH

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TECHNICAL MEMORANDUM

To: Hardy S. Bullock
Director of Aviation & Community Services
Truckee Tahoe Airport District
10356 Truckee Airport Rd.
Truckee, CA 96160

From: Rhea Gundry
Scott McIntosh

Date: November 13, 2017

Subject: Measured Aircraft Noise Comparison

Reference: HMMH Project Number 309360.000

1. Introduction



HMMH assisted Truckee Tahoe Airport (TRK) to compare noise levels of three fixed-wing single-engine aircraft: (1) A standard Cessna 172N (N1968F) that is based at TRK, (2) a previously measured¹ RedHawk Cessna 172P (N64686) with a retrofitted Jet A diesel engine and smaller diameter three bladed propeller and (3) a JT-A Skyhawk Cessna 172P (N688CS) from Textron Aviation with a retrofitted diesel engine. TRK arranged for the JT-A Skyhawk to fly in from Kansas for a side-by-side comparison of these aircraft to demonstrate the difference in noise level with the retrofitted diesel engine.

This memorandum provides the results of the noise measurements conducted on October 6, 2017 for the standard Cessna 172N and retrofitted JT-A Skyhawk at TRK and in the nearby surrounding community. These results build on prior noise measurements conducted at and around TRK on June 24, 2015 for the standard Cessna 172N and RedHawk.

2. Methodology

HMMH deployed four (4) Rion 32 noise meters on the airfield and in the community to obtain the A-weighted one-second time history noise levels in decibels (dB). Figure 1 shows the locations of each monitoring site and the flight tracks of both aircraft. Observers were stationed with the noise meters to listen and record each flyover event. Using the observer logs and recorded time histories, HMMH calculated the Single Event Noise Exposure Level (SENEL), which is also known as the Sound Exposure Level (SEL), for each of the aircraft noise events captured by the noise meters.

¹ Measurements conducted on June 24, 2015

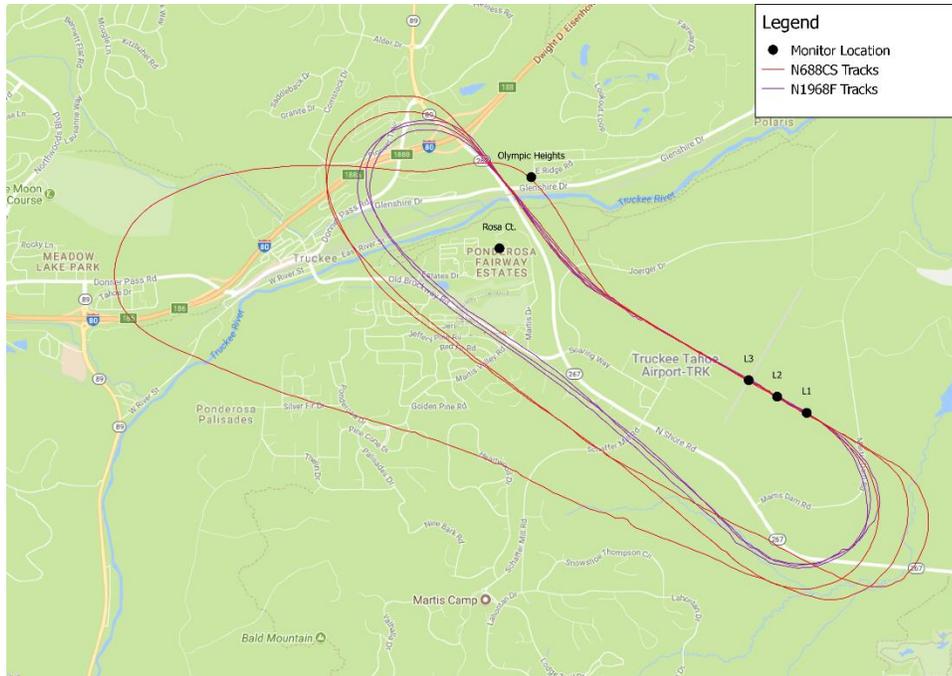


Figure 1. Study Area
Source: Map image and data © Google 2017

Three TRK airfield locations along the runway sideline (L1-L3) were measured to capture the difference between four unique elements of an aircraft departure, touch-and-go procedure, and arrival:

- L1) Start of takeoff roll
- L2) Engine rev 1000' down the runway of a touch-and-go procedure
- L3) 1) Touch-and-go procedure at rotation and
2) Touch down and final taxi on taxiway G

3. Noise Measurement Results

Table 1 shows the measured noise levels of each aircraft for the events listed above and the noise level difference between the standard aircraft and the retrofitted aircraft. From the previous report in 2015, we see that the RedHawk, with the retrofitted diesel engine, is consistently approximately 8 dB quieter than the standard Cessna (non-retrofitted) aircraft at sites L1, L2, and L3-1. The JT-A Skyhawk, with the retrofitted diesel engine, did not follow this consistent pattern when compared to the based standard Cessna aircraft, and is the result of inconsistencies in the way each touch-and-go procedure was flown. More specifically, the observed inconsistencies consisted of:

- At site L2, the standard Cessna was in the air over the monitor site with engine at idle coasting to land while the JT-A Skyhawk had just touched down and coasted past the monitor site. Site L2 did not capture engine rev for any of the 2017 tested aircraft.
- At site L3-1, the standard Cessna put wheels down exactly at the monitor site rather than capturing rotation.
- At site L3-2, a taxiing SurfAir aircraft contaminated the standard event.

Site L1, measuring the start of takeoff roll, is the only consistently flown element between both the standard Cessna and the JT-A Skyhawk and shows the JT-A Skyhawk is 2.5 dB quieter on takeoff. Due to the



inconsistencies between the standard aircraft events noted above, a better reference for review of the JT-A Skyhawk results would be to compare them to the 2015 standard Cessna events as shown in Table 2.

Table 1. Noise Levels from Aircraft Operations as Measured on the TRK Airfield

Source: HMMH

Event	2015			2017		
	Standard	RedHawk	Difference	Standard	JT-A Skyhawk	Difference
L1	98.6	90.1	-8.5	99.8	97.2	-2.5
L2	90.9	82.8	-8.0	70.6 ¹	75.9 ²	5.3
L3-1	94.6	85.8	-8.8	72.8 ³	85.7	12.9
L3-2	72.8	70.5	-2.3	88.5 ⁴	70.4	-18.1

Note:
 1. In air over monitor site with engine at idle, did not capture engine rev
 2. On runway passing monitor site with engine at idle, did not capture engine rev
 3. Wheels down, did not capture rotation
 4. Contaminated event



Table 2. 2015 vs 2017 Noise Levels from Aircraft Operations as Measured on the TRK Airfield

Source: HMMH

Event	2015 Standard	2017 JT-A Skyhawk	Difference
L1	98.6	97.2	-1.4
L2	90.9	75.9 ¹	-15.0
L3-1	94.6	85.7	-8.9
L3-2	72.8	70.4	-2.4

Note:
 1. On runway passing monitor site with engine at idle, did not capture engine rev

Table 3 and Table 4 show the 2017 noise level results for each demonstration aircraft event measured at each community location as well as the logarithmic average noise level of all demonstration aircraft events. Data from the previous 2015 study is also provided for purposes of comparison. While the operations of each aircraft were not identical, the pilots attempted to maintain similar aircraft path, altitude, and weight for the standard Cessna aircraft and the JT-A Skyhawk.

Across all events, the JT-A Skyhawk was between approximately 3 dB to 8 dB quieter at Rosa Ct. and between approximately 2 dB quieter to one-half dB louder at Olympic Blvd. when compared to the standard Cessna. On average, the JT-A Skyhawk was approximately 6 dB quieter than the standard Cessna at Rosa Ct. and 1 dB quieter at Olympic Blvd, respectively. Compared to data from the previous 2015 study, on average, the JT-A Skyhawk was approximately 1 dB quieter at Rosa Ct. and 6 dB louder at Olympic Blvd. than the RedHawk.

Table 3. Noise Levels from Aircraft Operations as Measured at Rosa Ct.

Source: HMMH

Event	2015			2017		
	Standard	RedHawk	Difference	Standard	JT-A Skyhawk	Difference
E1	78.6	71.2	-7.4	75.8	72.1	-3.7
E2	79.0	70.4	-8.7	77.7	70.5	-7.2
E3	81.4	78.2	-3.1	79.4	70.9	-8.5
Average	79.8	74.8	-5.1	77.9	71.2	-6.6

Note: Noise levels presented herein are A-weighted SENEL in dB

Table 4. Noise Levels from Aircraft Operations as Measured at Olympic Blvd.

Source: HMMH

Event	2015			2017		
	Standard	RedHawk	Difference	Standard	JT-A Skyhawk	Difference
E1	82.1	72.2	-9.9	80.3	77.5	-2.8
E2	83.3	71.9	-11.5	80.2	77.5	-2.7
E3	81.3	71.9	-9.4	80.4	80.9	0.5
Average	82.3	72.0	-10.3	80.3	78.9	-1.3

Note: Noise levels presented herein are A-weighted SENEL in dB



Using the same Rion noise meters and collecting one-second noise level time histories, HMMH calculated the equivalent sound level, Leq, of a full power run-up at 20-degree increments, 30 feet from each aircraft. Leq is the equivalent sound level measured throughout the noise event as though the sound level was constant throughout the event. For each of the measurements the front wheel of the aircraft was at the circles center with the nose/propeller facing 0 degrees. Figures 2 and 3 show the calculated directivities of the standard Cessna and RedHawk in terms of the Leq noise metric from data recorded during the previous 2015 study. Figures 4 and 5 show the calculated directivities of the standard Cessna and JT-A Skyhawk in terms of the Leq noise metric from 2017 data, respectively.

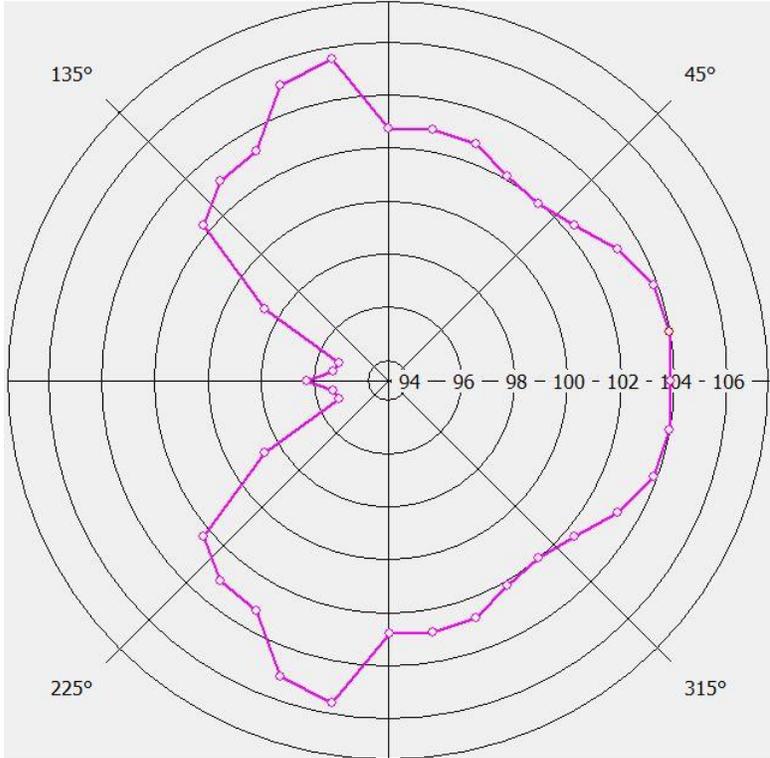


Figure 2. Directivity of N1968F (2015), Standard Cessna

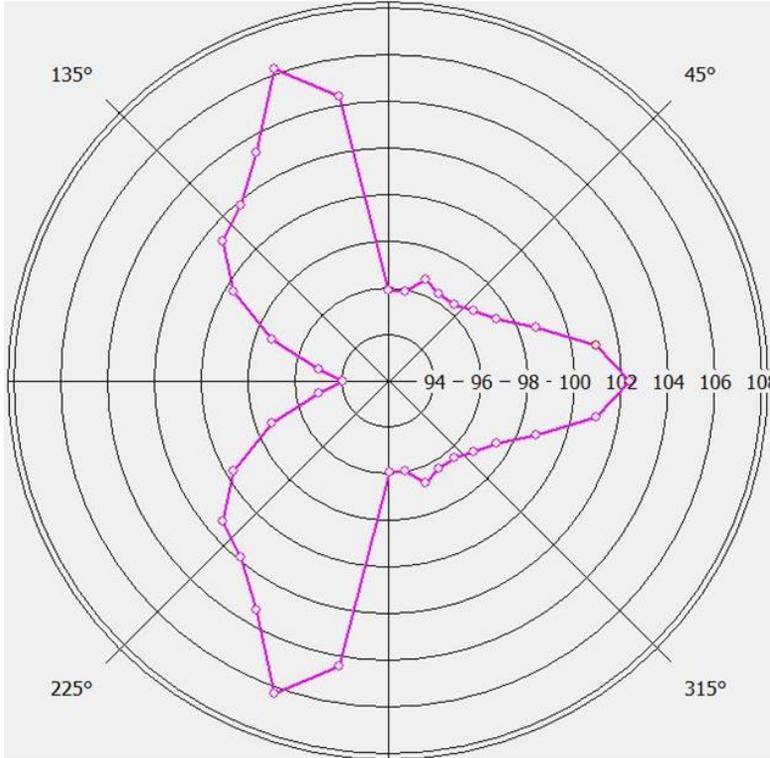


Figure 3. Directivity of N64686 (2015), RedHawk

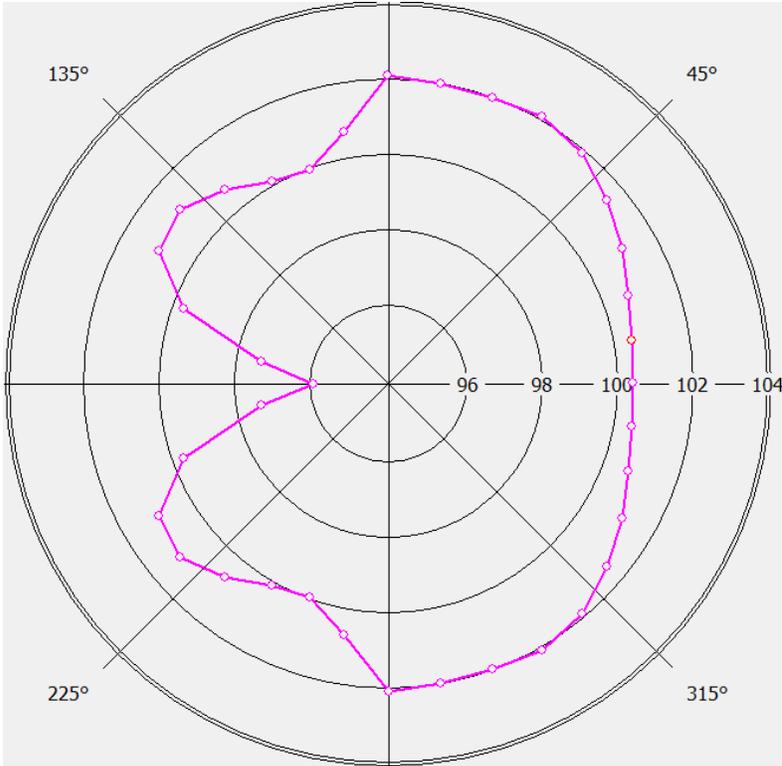


Figure 4. Directivity of N1968F (2017), Standard Cessna

Note: Scale for this directivity plot is different from the rest with a range of 96 dB – 104 dB

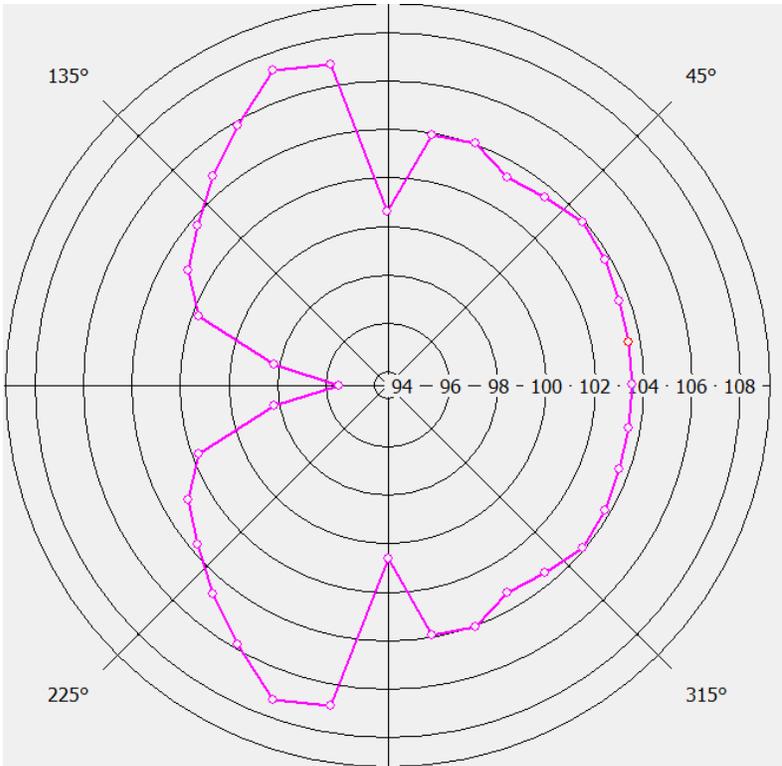


Figure 5. Directivity of N688CS (2017), JT-A Skyhawk

As shown in Figures 4 and 5, the 2017 calculated run-up directivity JT-A Skyhawk is greater than that of the standard Cessna in terms of maximum calculated noise levels. The standard Cessna maximum 2017 calculated noise level was approximately 102 dB, where the JT-A Cessna 2017 calculated noise level was 107 dB, respectively. Figures 4 and 5 also show the 2017 calculated directivity of the JT-A Skyhawk extends further to the left, right, front, and rear of the aircraft when compared to the 2017 calculated directivity of the standard Cessna. The JT-A Skyhawk 2017 calculated directivity reached levels of approximately 104 dB at the 45, 135, 225, and 315 degree measurement points on the front left, rear left, rear right, and front right sides of the aircraft when compared to the standard Cessna's 2017 calculated directivity levels of approximately 102 dB, respectively.

Compared to the 2015 calculated run-up directivity of the RedHawk as shown in Figure 3, the JT-A Skyhawk 2017 calculated run-up directivity maximum noise levels were greater than those of the RedHawk. The RedHawk maximum 2015 calculated noise level was approximately 106 dB, where the JT-A Cessna 2017 calculated noise level was 107 dB, respectively. Figures 3 and 5 also show the 2017 calculated directivity of the JT-A Skyhawk extends further to the left, right, front, and rear of the aircraft when compared to the 2015 calculated directivity of the RedHawk. The JT-A Skyhawk 2017 calculated directivity reached levels of approximately 104 dB at the 45, 135, 225, and 315 degree measurement points on the front left, rear left, rear right, and front right sides of the aircraft. Where the RedHawk's 2015 calculated directivity reached levels of approximately 97 dB at the 45 and 315-degree measurement points on the front left and right sides of the aircraft and 102 dB at the 135 and 225-degree measurement points, respectively.



4. Conclusions

The 2017 on-airfield measurements of the JT-A Skyhawk did not follow a consistent pattern of noise reduction when compared the 2017 on-airfield measured values of the standard Cessna or 2015 on-airfield measured values of the RedHawk. This was largely due to inconsistencies in the pattern flown between the standard Cessna and JT-A Skyhawk during the 2017 measurement period. However, when compared to the 2015 on-airfield measured values for the standard Cessna and RedHawk, the JT-A Skyhawk demonstrated consistent measured noise reductions of between approximately 1 and 9 dB over the standard Cessna.

The 2017 community event measurements for the JT-A Skyhawk demonstrated the JT-A Skyhawk was between approximately 3 dB to 8 dB quieter at Rosa Ct. and between approximately 2 dB quieter to one-half dB louder at Olympic Blvd. when compared to the standard Cessna. In the previous 2015 Study, the community event measurements demonstrated the RedHawk was between approximately 3 dB to 7 dB quieter at Rosa Ct. and between approximately 9 dB to 11 dB quieter to at Olympic Blvd when compared to the standard Cessna. On average, the JT-A Skyhawk was approximately 6 dB quieter than the standard Cessna at Rosa Ct. and 1 dB quieter at Olympic Blvd. Compared to data from the previous 2015 study, the JT-A Skyhawk was, on average, approximately 1 dB quieter at Rosa Ct. and 6 dB louder at Olympic Blvd. when compared to the RedHawk at both locations.

Finally, the 2017 calculated run-up directivity for JT-A Skyhawk was greater than that of the standard Cessna and RedHawk in terms of maximum calculated noise levels and extent of noise around the aircraft. The standard Cessna maximum 2017 calculated noise level was approximately 102 dB versus the JT-A Cessna 2017 calculated noise level of 107 dB, and RedHawk's 2015 calculated noise level of 106 dB. Furthermore, The JT-A Skyhawk 2017 calculated directivity reached levels of approximately 104 dB at the measurement points on the front left, rear left, rear right, and front right sides of the aircraft. This is greater than the 2017 standard Cessna calculated directivity levels of 102 dB at the same measurement locations, and the 2015 RedHawk calculated directivity levels of 102 dB on the rear left and right sides of the aircraft and 97 dB on the front left and right sides of the aircraft, respectively.



TURBO SKYHAWK JT-A

NEW DIESEL ENGINE ALTERNATIVE



CESSNA TURBO SKYHAWK JT-A

The Cessna® Turbo Skyhawk® JT-A aircraft features an advanced 155 horsepower turbo diesel Continental CD-155 engine for the world’s leading flight trainer. This next generation trainer operates with better fuel efficiency, while preserving the renowned flying characteristics of the legendary Skyhawk.

- **Garmin™ G1000™ NXi avionics with enhanced graphics, faster hardware, new features and optional wireless connectivity**
- **Powered by a 155 hp Continental CD-155 turbo diesel engine burning Jet-A fuel**
- **Single lever power control and engine automation makes flying easy**
- **A 25% reduction in fuel burn at high speed cruise, and a 38% improvement in maximum range over the standard Skyhawk**
- **Proven rugged airframe with forgiving flying characteristics**

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DIMENSIONS

Wingspan	36 ft 1 in	(11.00 m)
Length	27 ft 2 in	(8.28 m)
Height	8 ft 11 in	(2.72 m)

ENGINE

Continental CD-155	155 hp
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WEIGHTS

Max Takeoff Weight	2,550 lb	(1,157 kg)
Empty Weight	1,780 lb	(807 kg)
Useful Load	772 lb	(350 kg)

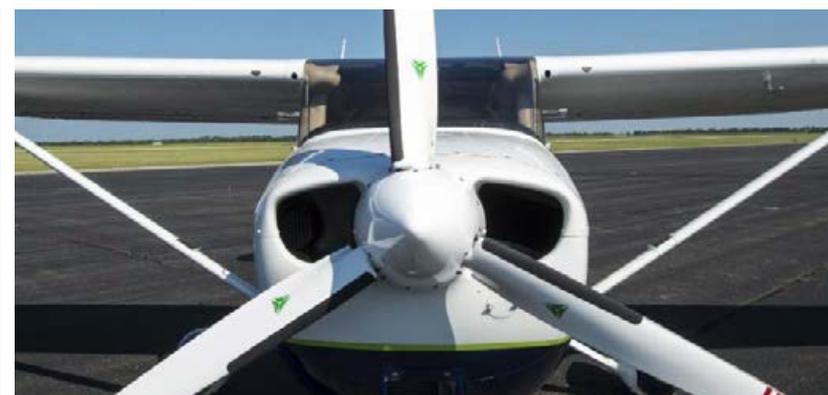
PERFORMANCE

Takeoff Ground Roll	944 ft	(288 m)
Max Climb Rate	712 fpm	(217 mpm)
Max Cruise Speed	134 ktas	(248 km/h)
Max Range	885 nm	(1,639 km)

MAX OCCUPANTS

4

* Performance data is based on standard conditions with zero wind. Field performance assumes a level, hard surface, dry runway. Range is based on a ferry mission with 1 pilot at 60% power with 45 minutes reserve. All data is preliminary and subject to change.



*Optional equipment may be shown.



**TRUCKEE TAHOE AIRPORT DISTRICT
BOARD OF DIRECTOR STAFF REPORT**

AGENDA TITLE: Procurement and Acquisition of Cessna Skyhawk 172 JT-A Training Aircraft

MEETING DATE: January 24, 2018

PREPARED BY: Kevin Smith, General Manager with assistance from the Aviation and Community Services Team.

The

RECOMMENDED ACTION: Authorize Staff to procure and purchase a Cessna 172 JT-A to further the goals and objectives as discussed at the November 29, 2017 Board Meeting.

DISCUSSION: The District has been discussing how to reduce noise and annoyance from repetitive flight operations for many years. As was discussed at the November 29, 2017 Board meeting, many programs have been implemented and various options considered to reduce the impact from these types of flight operations. The District first looked at this technology in 2015 but determined that the performance specifications of available aircraft at that time would not be an effective option. With the introduction last year of a factory built Cessna 172 JT-A it has been determined by the Board and Staff that there is now a platform that if acquired has real potential to positively address noise and annoyance from repetitive flight training and currency operations such as touch and goes.

At the November 29, 2017 after much discussion related to the potential annoyance reduction benefits the Board directed staff to place the procurement and acquisition of this aircraft as an Action Item on the January 24, 2018 Board Meeting. The Board also requested additional information related to the aircraft lease and operation agreement with Sierra Aero, a clear communication plan, financials, and more information related to operational Impact. To assist in the discussion and consideration of the final purchase decision, Staff has prepared the following information:

Aircraft Leaseback Agreement with Sierra Aero: Staff and Sierra Aero in consultation with District legal counsel have prepared the attached Aircraft Leaseback Agreement. This Agreement is the aircraft operational contract between the District and Sierra Aero. It outlines the terms of the agreement, fees for aircraft use, noise and annoyance reduction efforts, management fees paid to Sierra Aero, scheduling, maintenance, permitted aircraft use, etc. This Agreement is attached for your review. It is a fairly typical leaseback agreement as found in the industry. A few of the highlights the Board may want to review are as follows:

Section 3(A) – Fees for Aircraft Use. The District will charge \$150.00 per hour as the rental rate and keep the rate the same as the other Cessna 172 rented by Sierra Aero. If the District charges more than the Sierra Aero owned aircraft, some pilots and students may select the more economical option defeating the purpose of this program.

Section 3(B) – Noise and Annoyance Reduction. It should be noted that this agreement makes every effort to encourage repetitive flight operations to use the Cessna 172 JT-A but we cannot require all touch and go operations to use this aircraft. This is due to scheduling, type of training, maintenance, and in some cases pilot preference. Staff will make every effort to remind pilots and students of our goals and encourage them to use the JT-A for their touch and go operations. Staff, Sierra Aero, and our local flight instructors feel there will be a high take rate and desire to schedule the new aircraft. It's our opinion that there will be a natural migration to the JT-A for training purposes. This is especially true for students pursuing professional careers as pilots due to the advanced avionics of the JT-A.

Section 3(C) addresses replacement of an Existing Sierra Aero aircraft. It is the intention of Sierra Aero to remove 1968F from their rental fleet. This will become a personal aircraft for Sierra Aero's use and will not initially be in the rental fleet. However, per Sierra Aero's lease they do have the ability at a future date to add additional aircraft to their fleet. They have indicated that they will consult with the District before they add additional aircraft to their rental fleet.

Section 4 – Commission. Sierra Aero will keep \$60.00 per hour for scheduling, logistics, and management of the District aircraft. The District will receive \$90 per hour.

Section 7 – Maintenance and Care. From the \$90 discussed in Section 4, the District is responsible for fuel, oil, and aircraft maintenance, insurance, and hangaring.

Communications Plan. Attached to this report is a Plan outlining how the District will incorporate this new noise and annoyance program into the greater communications programs and how we plan to communicate with the pilots and the public regarding the goals and objectives of this initiative.

Operational Impact Assessment of Cessna JT-A vs Piston C172. Combined, the 2 primary rental aircraft, both Cessna C172 Skyhawks, on the field flew a total of 1,100 hours in 2017. The split was nearly down the middle so replacing either of the aircraft would take approximately 550 hours of aircraft rental time in a traditional piston configuration and replace it with hours in the

JT-A model. While not every hour flown in a rental aircraft is devoted specifically to touch and go operations, it is estimated that the large majority are. Most training flights start and end with at least a few trips in the pattern.

Of the 617 community annoyance comments received in 2017, 44 were specific to touch and go operations. Olympic Heights, Martis Valley Estates, and Sierra Meadows are the 3 residential zones near the airfield which routinely make comments regarding touch and go flights. In discussion with local CFIs and Sierra Aero, there was consensus that rental usage would be largely the same if one of the piston aircraft was replaced with the JT-A model, in other words a new aircraft would not drive more training operations overall. According to CFI respondents, the average for touch and go operations per hour was safely 6, so the replacement could reduce noise impacts from well over 2,700 operations.

Financial Pro forma – This was discussed and reviewed at the November 29, 2017 Board Meeting and is attached as Attachment B. The pro forma attached is substantially the same as the one provided at the Nov. 2017 Board of Directors Meeting.

WHAT'S NEXT: If the Board is in agreement with the information provided and approves the motion to acquire the aircraft, staff will finalize agreements with Cessna/Textron Aviation for aircraft acquisition not to exceed \$515,000. Staff will also finalize the Lease back agreement with Sierra Aero and implement the Communications Plan. Staff is in process of receiving an estimated delivery date on an aircraft and will have that information at the Board Meeting. It should be noted that the District also looked at the Piper Archer DX which is the only other production diesel aircraft available and operates the same engine as the Cessna JT-A. Staff recommended the Cessna JT-A over the Piper Archer DX based on two considerations; 1) the base price for the Piper is about \$20,000 more than the Cessna JT-A, and 2) Sierra Aero operates Cessna 172 aircraft making the transition for maintenance and pilots much easier.

FISCAL IMPACT: Total cost of acquisition is approximately \$515,000 for the Cessna 172 JT-A including sales tax, licensing, etc. (Base Price is \$435,000) Per the pro forma, the aircraft generates revenue to offset a portion of these costs. The aircraft is a tangible asset which could be sold if the program is deemed unsuccessful recovering a significant portion of the initial acquisition costs. Funding for this project is budgeted in the CY2018 Budget.

PUBLIC COMMUNICATIONS: See the attached Communications Plan memo.

SAMPLE MOTION(S): I move to (approve, continue, deny) the proposal to purchase a Cessna 172 JT-A aircraft with a not to exceed budget of \$515,000 and authorize Board President to sign purchase agreements and finalize and sign leaseback agreement with Sierra Aero.

ATTACHMENTS:

Attachment A – Cessna 172 JT-A Aircraft Information

Attachment B – Financial Pro forma

Attachment C – Sierra Aero Cessna 172 JT-A Leaseback Agreement

Attachment D – Communications Plan

Attachment E – Staff Report from November 29, 2017