AGENDA ITEM: 15

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 fasted 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 while 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