

## TRUCKEE TAHOE AIRPORT DISTRICT BOARD OF DIRECTOR STAFF REPORT

## AGENDA TITLE: Noise Mitigation Strategies Discussion and Review of Airspace Assessment Phase II Progress

MEETING DATE: September 27 2017

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

**RECOMMENDED ACTION:** Review the attached information discussing potential noise mitigation strategies. Receive guidance and answers to questions related to the Airspace Assessment Phase II.

**DISCUSSION:** In an effort to reduce annoyance from aircraft overflight Staff is presenting concepts for Board review. While not an exhaustive list of current options, the three concepts, *Directional Arrow and Heading, Diesel Aircraft, Arrival Procedures and Surveillance* are relevant to the current discussion of possible solutions.

**Directional Arrow and Heading:** The "*Bypass Departure*" pictured below (Figure 1), is the primary method of visual departure off runway 29. Olympic Heights is 900 feet north east and Martis

Estates is 900 feet south west. In an effort to avoid residential overflight staff has installed a directional arrow and suggested heading. (Figure 2).



Figure 1: Runway 29 Departure

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Figure 2 and 3 illustrates the addition of the painted arrow and suggested heading to create a ground track of approximately 300 degrees magnetic placing the aircraft over the intersection of highway 80 and 89 avoiding residential areas for that portion of flight. Aircraft speed, climb performance, wind, cloud cover, traffic, separation and other factors will affect the final ground track of the aircraft. The tower controllers have opined that a clearance of, *"after departure fly heading 300 to 180 then on course"* works well in concert with the arrow, published noise abatement procedures, maps, videos, and animation that the airport currently provides to pilots. The narrow corridor coupled with short segment length make this phase of flight difficult to navigate during a period of heavy flight workload. Staff flew this heading at various speeds and altitudes attempting to replicate different types of aircraft performance envelopes. Under the test scenario the aircraft was usually located close to the center of the bypass bridge.



Figure 2



Figure 3

**Diesel Powered Aircraft:** The Cessna Turbo Skyhawk JT-A aircraft <u>was</u> scheduled to arrive and begin flight testing at Truckee Tahoe Airport on September 13<sup>th</sup>, 2017. The aircraft was delayed while undergoing maintenance. Staff anticipates flight testing the aircraft in early October. HMMH will be conducting noise analysis on the aircraft when the aircraft is here at KTRK.

**Arrival Procedures:** Arrival procedures allow aircraft to transition from the enroute segment of flight, usually under the control and guidance of ATC, into the airport environment and ultimately land. Departure procedures work in the opposite direction and were the subject of multiple community outreach meetings in the summer of 2016. The conceptual departure procedures in Phase I of the airspace study have been submitted to the FAA for comment in addition to potential modifications to existing departure procedures. A departure procedure off every runway of the airport is currently under review. Those draft procedures may be reviewed here: <a href="http://truckee.airportnetwork.com/Home/Documents">http://truckee.airportnetwork.com/Home/Documents</a>.

The arrival procedures included here are conceptual or notional, they are a good idea that has some criteria analysis and critical design from the community perspective. The goal is to review all the possible arrival procedures both visual and instrument. Limiting factors include terrain on three sides of the airport and the enroute structure outside the area that is required to correlate with any new procedures at the airport. Once Staff receives guidance the final procedures will be presented to the Board prior to commencement of community outreach efforts.

Three components of noise contribute to its annoyance: intensity (total noise energy usually measured in decibels), frequency (the pitch of the sounds) and duration (length of time one perceives the sound). Aircraft are getting quieter, thus a reduction of total noise energy which the airport has no control over. The airport can't control the particular pitch of the aircraft noise either. The airport can however attempt to influence the duration of the noise exposure from aircraft. We do this by trying to get the aircraft away from the community environment faster. We do this by:

- 1. Asking them to climb faster
- 2. Getting them to be higher over areas of residential development
- 3. Giving them straight line procedures to the airport thus reducing track miles flown and reducing the duration of noise and reducing greenhouse gas emissions.

All of the arrival procedures below are predicated on the principal that reducing track miles will reduce annoyance and greenhouse gas emissions while the aircraft flies the most community friendly route over areas of lowest residential density. There is a balance between reducing duration, runway utilization, and residential overflight that make a flight the lowest possible impact event. Figure 4 below tells the story. The aircraft followed the Bypass departure then turned west towards his Bay Area destination and overflew Tahoe Donner. A better route would have been either a straight out departure with a left turn or a Bypass departure with a west bound heading. This illustrates the principal of reduced track miles. This is the most common comment from the Tahoe Donner neighborhood. Any close-in procedure decisions, while well intentioned, must be examined from a holistic perspective to avoid this addition of track miles.



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Figure 5 is an approach to runway 29 from the West. Straight line, continuously descending on a route common to aircraft arriving from the Bay area. The procedure would terminate in a visual arrival to runway 29 or a circle to the landing runway.



Figure 5

Figure 6 is an approach to runway 29 from the west or south (previously know as Lake Tahoe Visual RNAV). Both good routes follow areas of lower terrain in areas of low residential density. These procedures are fairly complex and would require a well trained aircrew flying a capable aircraft. Significant reductions of runway 29 downwind overflight in the Sierra Meadows neigborhood would be a clear benefit.



Figure 6

Figure 7 is an approach from the south arriving either from the Lake Tahoe area or the Squaw Valley VOR. A popular approach corridor for KTRK. This approach would have a long continuous decent to the north bound runway 02.



Figure 7

Figure 8 is an approach designed to get aircraft onto runway 11 from the west. The intermediate waypoint, (WP245) is needed to achieve the maximum angle of intercept for the final approach course while still essentially locating the path over the freeway, an area of ambient noise.



Figure 8

Successful development of either visual or instrument procedures for KTRK requires both approval from the FAA and acceptance from the community. The next two figures illustrate the required components to successfully develop certified and published procedures that will allow the airport to control the flight path of some arriving aircraft.



**Surveillance ADS-B update:** In 2020 the FAA will mandate that most aircraft equip themselves with a satellite beacon. This beacon is called an Automatic Dependent Surveillance Broadcast Unit (ADS-B). To affect influence over aircraft we need surveillance that includes ADS-B technology. The District's current system of Wide Area Multi Lateration will not provide this surveillance coverage. Staff has been working with the FAA Office of Surveillance & Air Traffic Management to allow installation of this ADS-B technology.

Harris is the FAA prime contractor who owns the technology and deploys it on behalf of the FAA through a joint service agreement to airports, control authorities, and airlines. In order for the District to install ADS-B sites and facilities here we need a contractual agreement with Harris and the FAA. Recent progress has been made and multiple meetings with the FAA are scheduled for the second week of October. The goal being to collect all available information for a Board decision on benefits and cost of installation along with a rough timeline for the approval process.

**NEXT STEPS**: Each project is ongoing. The directional arrow has associated clearances from the control tower that will enhance its effectiveness. When the tower is operational staff will direct them to issue the supporting clearance when appropriate. The JT-A Skyhawk is scheduled to be flight tested for noise impacts in October. Once complete, staff will update the Board. The airspace Phase II project will require procedure approval from the Board and community outreach. Staff anticipates this to occur in early 2018. ADS-B deployment is in the infant stages. Staff will have more information at the November 2017 regular Board meeting.

**FISCAL IMPACT:** Each project is under consideration by the Board for final funding except the Airspace Phase II assessment which is budgeted in FY 2017-2018 for a total amount not to exceed \$90,000.

**PUBLIC COMMUNICATIONS:** Each of these topics has been covered in multiple Board meetings advertised through the public meeting process. Staff is responding to commenters about the noise mitigation efforts directly. The airspace assessment will require significant community outreach. Once the board approves the procedures staff will organize an outreach effort describing each procedure to each neighborhood.