Background Information: Updated May 2022

Southern Departure Procedure Task Force

Purpose of the Study

The purpose of the Southern Departure Procedure Study (the "Study") is to further investigate the feasibility of a procedure for southern departures that could reduce noise for the entire community south of the Jackson Hole Airport (the "Airport"), while taking into consideration other noise sensitive areas such as the Elk Refuge. The Study will determine if one or more such procedures are feasible and, if so, the Airport will move forward to conceptually design them. The intent of the Study is to build upon the well-developed existing noise abatement program in place at the Airport and, using the most current technology, look for ways to further reduce noise at noise sensitive area without shifting noise over others.

In connection with the Study, the Departure Procedure Study Input Task Force (the "SIT") was organized to provide input and consultation on the process. The SIT meetings will be used to obtain stakeholder input, address questions and ensure understanding of the Airport's and FAA's roles. It will also identify the challenges of designing such procedures relative to FAA standards and criteria, and constraints to flying certain procedures. The work of the SIT will be completed at the end of the Study.

There are three distinct phases of the Study, as shown in the following graphic. The end goal is submittal of the procedures to the FAA portal.

Phase 1: Preliminary Analysis

Tasks: Review of KICNE ONE, ALPIN Three, and TETON Three (existing procedures) to vet potential noise shifting with these procedures, noise modeling on procedure, first and second SIT meetings, noise education (website). Review & communicate FAA design limitations that must be adhered to.

Phase 2: Development of Procedure Concepts

Tasks: Develop preliminary designs for a new conventional noise abatement departure procedure, and up to 2 special procedures, noise modeling/visualizations, coordination, third SIT meeting, updates to noise education (website), video production. If concepts show a noise benefit without a shift in noise, could then move forward with additional analysis.

Phase 3: Refinement of Procedures

Tasks: Refinement of procedures based on routing feedback, fourth SIT meeting, documentation, and application of plan for next steps. A special procedure could move forward if it would provide meaningful noise reduction without substantial shifting of noise. If a conventional procedure is determined to work, it will be submitted to the FAA. Determine if flight test should be conducted to assess benefit.

End of Project: Submittal to FAA, if applicable - Schedule 8 months

Tasks: If a conventional procedure is found to benefit the community, it will be submitted to the FAA portal by the September deadline. If only special procedures provide benefit, full special procedure development can proceed as a follow-on Task.

Background

The Jackson Hole Airport is the only airport in the United States with regular commercial service located entirely within a national park. The Airport operates under the 1983 Use Agreement between the US Department of the Interior and the Jackson Hole Airport Board ("1983 Agreement"), which restricts certain activities and facilities, and imposes stringent noise and other environmental standards. In compliance with the 1983 Agreement, and in many cases going beyond the requirements of the 1983 Agreement, the Airport Board has implemented a range of mitigation measures which are described below. Specifically, the 1983 Agreement required the development of a Noise Abatement Plan. The primary objectives of the Noise Abatement Plan as stated in the 1983 Agreement were "to ensure that future airport operations are controlled in such a manner that aircraft noise exposure will remain compatible with the purposes of Grand Teton National Park and will result in no significant increase in cumulative or single event noise impacts on noise sensitive areas of the Park." The 1983 Agreement also creates a critical area boundary, into which the 45 DNL noise contour cannot extend, and a noise sensitive boundary into which the 55 DNL noise contour cannot extend. The noise control plan must utilize "the latest in noise mitigation technology and procedures, and must "be developed in a comprehensive study to consider all of the relevant environmental, economic, and operational considerations."

The 1983 Agreement and Noise Abatement Plan contain the following conditions and noise abatement measures:

- **Noise measurement at the Moose location cannot exceed 55 DNL annually,**
- **A defined Critical Area Boundary within the Park of 45 DNL, and**
- **Aircraft single event noise on approach cannot exceed 92 dBA (as defined by the approach dBA level from FAA Advisory Circular 36-3H).**

To meet the above requirements of the 1983 Agreement, the Airport Board developed an Airline Access Plan. The Airport Board would be barred from creating something like the Airline Access Plan today, because local noise and access restrictions were significantly curtailed under the Airport Noise and Capacity Act of 1990 ("ANCA"). Importantly, the Airline Access Plan is considered "grandfathered", meaning not subject to the limits of ANCA, because it was adopted under the 1983 Agreement and ANCA was not intended to limit preexisting noise rules. But, this also means that the Airport Board could not amend the Airline Access Plan to make it more restrictive, since any such measures would not be grandfathered and would trigger ANCA.

The Airline Access Plan placed a limit on the number of operations of commercial jet aircraft which could occur at the Airport. (The limit on operations was determined to be the noise equivalent of 6.5 Average Daily Departures of the 737-200/D17 aircraft.) Increases in operations could only be accomplished by substituting these aircraft with the quieter, new

generation aircraft, which at that time were just entering service. The Airline Access Plan also requires commercial jet aircraft to schedule arrivals between 0700 and 2130.

Major sections of the Noise Abatement Plan include maximum noise level limit, cumulative noise standards, aircraft operating procedures, operations specifications amendment for scheduled passenger service airlines, requirements for aeronautical contractors, noise complaint/inquiry report system, and educational efforts. The Airport Board requires compliance with the contents of the Noise Abatement Plan in all operating agreements with air carriers and commercial general aviation operators.

Additionally, because of an Act of Congress obtained specifically for the Jackson Hole Airport, since 2004 the noisier Stage II aircraft have not been permitted to operate at the Airport. As mentioned, FAA approval would be required for any additional noise or capacity restrictions at the Airport.

These noise abatement measures, and improvements to these measures, are tracked annually as listed below. See sections below for greater detail.

- **Summary of Noise Measurements and Modeling**
  - **Noise Monitoring System Updates**
  - **Day Night Level (DNL)**
  - **Annual Average Daily Departure**
  - **Single Event Levels and Preferential Runway Use**
  - **Voluntary Curfew**
  - **Summary of Noise Monitoring Results and Trends**

The requirements in the 1983 Agreement are further augmented by the Airport through continuous reevaluation to identify potential improvements. This has historically been done through the 14 Code of Federal Regulations (CFR) Part 150 Noise Compatibility Study, which allows the Airport to review alternatives to reduce noise. Review of departure procedures was one of the recommendations in the previous Part 150 Study.

The FAA has been developing satellite-based procedures for Jackson Hole Airport. One of these approach procedures was implemented at the Airport to shift flights arriving from the north further away from the noise sensitive areas of the National Park, and thus reducing noise levels in the Park. Since then, the FAA developed the KICNE ONE south departure procedure. Because, data was unclear on what effects this procedure would have on the community, the Airport initiated the Southern Departure Procedure Study at its own cost. This Study seeks to determine the potential changes in noise that would result from implementation of KICNE ONE, and if that procedure or another procedure could provide the community with noise reduction benefits.

Frequently Asked Questions

Frequently asked questions about noise, noise analysis, and procedure development are included below. These are to assist the SIT members with background knowledge that will be helpful in Task Force discussions. The team also can provide further definition of terms during meetings, as needed.

What is a visual based procedure?

Up until the 1990s, there was a higher use of "visual" procedures. In these visual procedures, a pilot did not have the benefit of a pre-defined track to avoid terrain, and instead they were given an option to accept responsibility for terrain clearance when there was good visibility. With advances in flight deck automation systems, and the increased set of options that come with an automation system that is constantly calculating back-up plans in the background, commercial flights are now expected to stay on routes that the flight deck automation can guide. This means less pilot discretion and more safety assurances.

What is the history of the visual left turn and connection to this study?

The FAA instituted a noise abatement left turn in the early 1980s. Due to terrain issues and updates to the FAA standards and procedures, this left turn procedure was eliminated approximately 20 years ago. In 2019 the Airport completed a 14 CFR Part 150 Study that recommended the implementation of the historic left turn or a similar procedure using NextGen technology. In response, the FAA developed a proposed procedure called the KICNE ONE. Per current criteria, the KICNE ONE could not fully mirror the historical left turn. Due to questions about potential noise impacts of the KICNE ONE, the Airport requested that the FAA pause the implementation of KICNE ONE to allow for additional analysis and community outreach. This Task Force was created as part of the analysis process.

Why "instrument" procedures?

In the past when pilots navigated mostly by tuning into ground-based electronic signals, pilots had to conservatively plan to factor in any variations in the signal. This meant flight paths were planned with 4-mile buffers on each side of the planned path. At times, especially in mountainous areas where the terrain limits the line of sight for electronic navigation signals, the available flight paths could be limited.

Up until the 1990s, that scenario set up conditions where pilots might elect to use "visual" procedures instead. In essence, they were saying, "I see the terrain, I will fly so as to safely climb above it." In that way they could save time and fuel by going more directly to their destination.

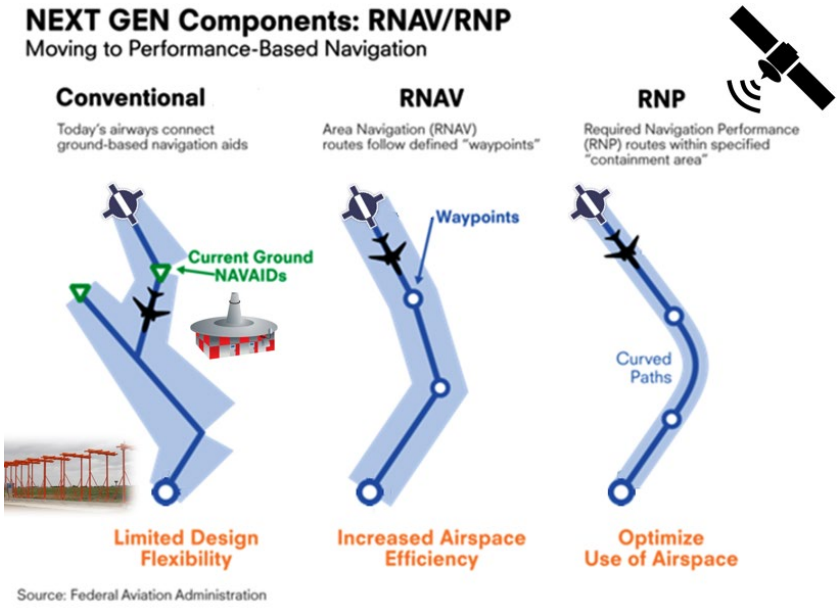
However, as automation capabilities improved on board the aircraft, safety planners focused more and more on the abilities of a good automation plan to work in the background and to always calculate back-up plans for the pilot. As the flight progresses, the automation system now calculates thousands of back-up plans that are rarely used. It is always considering the aircraft weight, the winds, the distance from an airport, the terrain, etc., to make sure that if there ever is an indicator to the pilot that something isn't right, the pilot immediately has good options to choose from. While automation systems were improving, navigation technology was improving as well. GPS (Global Positioning System) and other forms of navigation now allow the pilot and the on-board automation system to know the precise location of the aircraft in more detail than was available in the 1980s.

The combination of flight deck automation and increased precision of navigation now means flight procedures are built to achieve the right balance of terrain clearance, energy/fuel efficiency, and operational back-up plans all the time. The safety balance of those concerns remains the same whether it is visual conditions or instrument conditions. Airlines typically train pilots to fly procedures where the automation is connected to the continuous planned track of the aircraft at all times. This maximizes the efficiency and the decision-support tools available to the pilot.

The payoff for this approach is the incredible safety of U.S. aviation. In the 1980s and 1990s the aviation community liked to emphasize that air travel was the safest form of transportation, and it was. But the industry recognized a need to continually improve, and the safety levels of today have increased over an order of magnitude since the 1980s-1990s. The FAA standard is now "one in a billion." This means the goal of the system is to reduce the likelihood of a major accident to one in a billion flights. When arrival and departure procedures are being built, they are building not only well thought out paths to/from an airport, they are building safety into the system.

What is NextGen?

The Next Generation Air Transportation System (NextGen) is the FAA-led modernization of America's air transportation system to make flying safer, more efficient, and more predictable. To understand NextGen, it's helpful to understand instrument procedures. The navigation capabilities of each aircraft have a high degree of variability. These navigation specifications can generally be split into three groups: Conventional (radio based), Area Navigation (RNAV), or Required Navigation Performance (RNP) (detailed in the graphic below). RNP are generally only useable by airlines and highly equipped business jets, but provide the most optimized and efficient use of airspace.



What needs to be considered when looking at developing procedures?

When designing a new arrival or departure procedure, there are multiple goals. The list of goals has become longer as automation systems have advanced, and all the goals need to be addressed to design a good procedure. Usually, a procedure is designed with all the goals in mind and then conducted in flight simulators to ensure all the different functions work together to achieve the desired result.

Procedure criteria include the following:

> **Climb to Altitude:** Before commencing a turn, aircraft flying an Instrument Flight Rules (IFR) departure procedure must reach an altitude of 400 feet Above Ground Level (AGL) for conventional radio navigation and 500 feet AGL for Area navigation (GPS) procedures.

Required Terrain Clearance: Minimum terrain and obstacle clearance based on sloping and flat surfaces is required for various segments of the approach. A procedure needs to consider the climb rates for different types of aircraft in different weather conditions (slower climbs in hot weather) to achieve the minimum required amount of space between the aircraft and the ground. Unfortunately, terrain doesn't generally follow a straight path, so we must balance the track of the procedure with the best clearance available over the ground.

Aircraft Performance: When assigning higher than standard climb gradients (to ensure the aircraft clears terrain) the procedure must consider a wide range of different aircraft performance capabilities. Different aircraft types climb at different rates based on engine thrust and additional environmental factors such as temperature, pressure, and winds. There are also bank angle limitations set by the aircraft certification rules that govern how steep of a turn can be accomplished.

Flight Management System Execution: Modern day flight procedures utilize predefined paths that the pilots can load from the aircraft's onboard computer system also known as the Flight Management System. All new procedures are designed to be fully "fly-able" by the onboard automation systems. This means they must meet specific computer programming language referred to as ARINC 424.

Contingency Procedures: For Part 121 and 135 (commercial operations), the pilot must ensure a viable path is available in the case of a mechanical issue such as an engine failure. When designing a procedure, not only must the normal procedure be considered, but also the back-up procedure as well. The consideration of the back-up procedure in many cases is what limits a procedure element such as climb gradient or bank angle. A back up procedure considers what happens at any point if an engine has a problem during takeoff and climb out. All the systems must automatically have the necessary guidance and power to execute a return maneuver to safely land at the airport, including necessary safety margins for terrain clearance.

Ground Track: There are typically community desires to create procedures that tie into desired ground tracks (areas on the ground that correspond to more compatible land uses). Understanding how the aircraft automation navigates is key to developing a viable procedure that can be used across a wide variety of aircraft.

Fly by versus a flyover: Each waypoint designed into a flight procedure is coded in the automation system to achieve flight guidance the aircraft automation will understand. One of the variations in the waypoint programming tells the aircraft automation to get as close as it can to flying "over" the exact waypoint or if it the turn can be rounded off and thus the point can be a "fly by" point and just pass close to it.

Instrument flight procedures show straight lines between points, but aircraft don't turn instantaneously and therefore some rounding off of flight paths occurs at waypoints involving turns. If the programming declares a point as a "flyby" point, then the aircraft will anticipate the need for the turn and begin the turn prior to the waypoint, rounding off the turn to the inside and completing the turn near the waypoint. If it's declared a "flyover" point, then the aircraft will get to the point before beginning the turn and therefore the rounded off turn happens after the waypoint.

Turn Anticipation: When designing procedures using standard Track to Fix (TF) legs and fly by waypoints, a specific amount of distance is needed to complete the turn within the desired obstacle containment area. The amount of distance required for the aircraft to be able to complete the turn without overflying the waypoint is called Turn Anticipation.

Connecting to higher altitude en-route environment: A departure procedure must create a safe track, based on an assumed climb rate for the aircraft, to navigate automatically and get to approximately 14,000' (south of Jackson) in order to be above terrain, and allow air traffic controllers to control the flight from there. Everything below 14,000' has to be programmed into a procedure based on a calculated safe climbing route.

A departure procedure also must inform the automation on board the aircraft of the exact track to be flown and evaluated, so that if an engine problem occurs at any point, there is a back-up plan from that point to the airport. This adds complexity and limits options as to what can be flown when high terrain is present.

How is aircraft noise evaluated?

In 1981, the Federal Aviation Administration (FAA) formally adopted the Day Night Average Sound Level (DNL) as the primary measure for determining exposure of individuals to airport noise. Day Night Average Sound Level is the annual, 24-hour average sound level, in decibels, obtained from the accumulation of all noise events, with the addition of 10 decibels to weighted sound levels from 10:00 P.M. to 7:00 A.M. The weighing of nighttime events accounts for the fact that noise events at night are more intrusive when ambient levels are lower and people are trying to sleep. The 24-hour DNL is annualized to reflect noise generated by aircraft operations for an entire year and is identified by "noise contours" showing levels of aircraft noise.

DNL is the most widely accepted descriptor for aviation noise because of the following characteristics: DNL is a measurable quantity; DNL can be used by airport planners and the public who are not familiar with acoustics or acoustical theory; DNL provides a simple method to compare the effectiveness of alternatives; and DNL is based on survey data regarding the reactions people have to noise. However, additional recent survey data has shown how differently people can perceive noise. That perception of noise is what this Study will try to address by primarily using single event noise metrics, described below in more detail.

Can you take seasonality into consideration with DNL?
Yes, we currently can run seasonal contours (Summer and Winter), and do that in the annual noise report. Contours do fluctuate over the year. Over time, seasonal fluctuations as Jackson Hole have gone down as the seasons are starting to extend. You can look at these seasonal fluctuations in the noise report. However, seasonal contours are not an appropriate method of analyzing noise impacts, as you need to do a cumulative year long average. (See response below on separate, non-DNL noise analysis which will be used for this Study).

For this Study, are other noise metrics used?
Sometimes the Day Night Average Sound Level (DNL) metric used in Federal noise studies is criticized because it represents the steady state of noise over a 24-hour period for an entire year, which can seem to downplay noise events that can have large effects on residential populations and does not accurately portray what people actually hear on a day-to-day basis. This Study will present data with single event metrics (such as Lmax) to help illustrate what people hear with a flyover.

Because of the unique location of the Jackson Hole Airport within Grand Teton National Park, this Study takes into account additional considerations that are required by the 1983 Agreement between the Department of the Interior and the Board.

Can you take seasonality into consideration with the noise analysis for this Study?
Yes. The permanent noise monitoring sites continuously measure noise throughout the year. The data at these sites will be used to show the seasonal difference in noise. The primary factors that can affect the noise generated by an aircraft are temperature, wind speed, and load factors. Data at the two permanent noise monitors can be used to show the relative difference in the measured noise levels in each of the seasons.

Can you give us more information on how seasonality affects noise? Can a seasonal path be considered?
Typically, during summer, higher temperatures require aircraft take longer to climb and get to the 500 feet above ground level, when a turn can be initiated. Seasonal paths could be considered, and the team recognizes that summer months are important to the community, with value on outside life, as well as the considerations of wintering grounds for the elk during winter months. Ultimately, the FAA will make the final decision on the procedures, however the study team will investigate a procedure that is used primarily during the summer season under clear weather conditions.

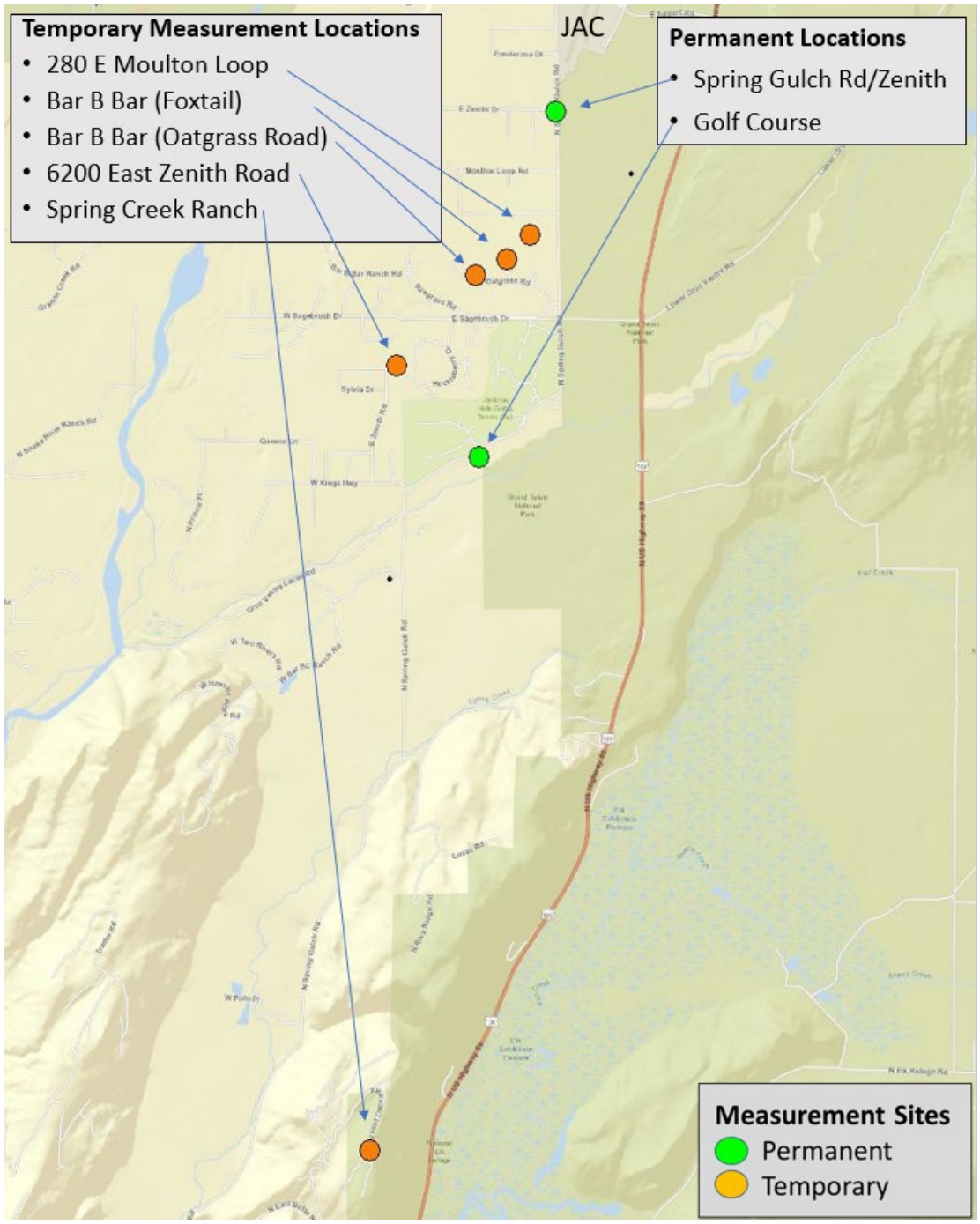
How does noise monitoring and noise modeling differ and how will they be included in the study?

Evaluation of the noise levels from potential procedures is done through modeling using the FAA's standard Aviation Environmental Design Tool (AEDT), which is updated frequently to account for current aircraft, operational considerations and modeling enhancements. The current version is AEDT 3e, which was just released on May 9, 2022. Monitoring can help to validate the modeling through using actual data compared to the modeled information to ensure that the modeled noise is consistent with the actual measured on the ground noise. The model can them be used to predict noise at any location around the airport and for the various flight procedures under consideration. The analysis will also present information as to how often each of the different procedures might be flown.

Modeling will be done in terms of single event maximum noise level contours and predicting the noise at representative locations at various points around the valley. The data presented will show the current single event noise levels and the predicted changes with the various procedure options. The modeling takes into account how high an aircraft is above ground level, the flight path flown and the load of the aircraft.

The Airport has a comprehensive noise modeling program in place and has so for many years. In response to recent comments, additional monitors were temporarily added south of the Airport to help supplement this data and will be used to vet the modeling results. The data will be used to vet modeling results but will be removed as they have provided the needed data for this Study. The southern noise monitoring locations are included in the map below. The temporary sites are shown in Orange. The two permanent sites to the south are shown in Green. These sites are part of a broader noise monitoring system of permanent monitors and also assist in the evaluation of the Fly Quiet Program.

Southern Noise Monitoring Locations – Permanent and Temporary

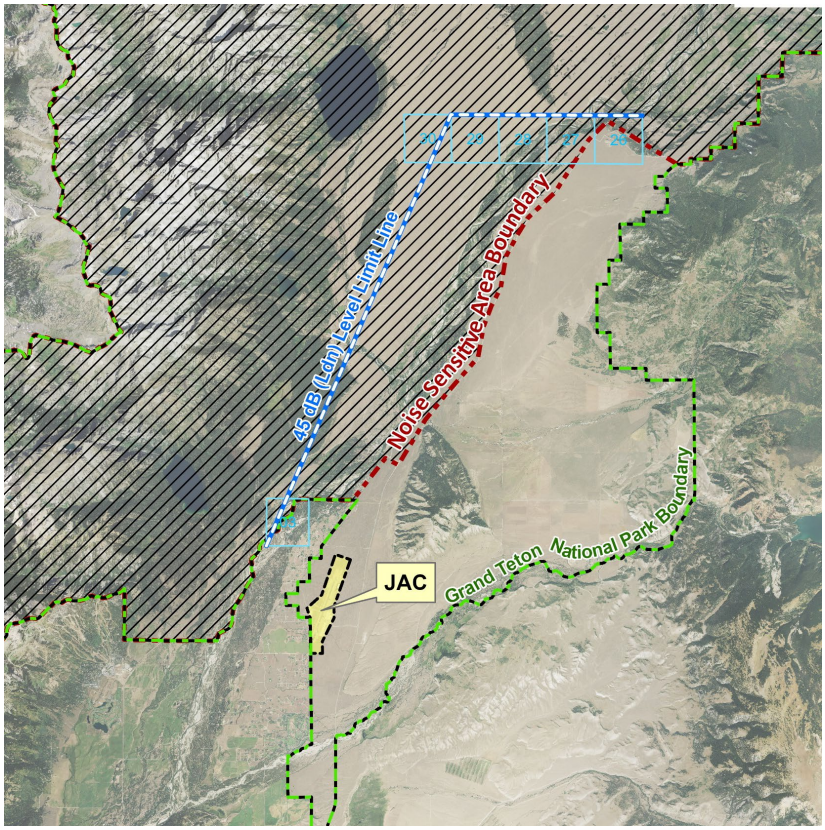


The area has very low ambient noise, is there a threshold that accounts for the change, as compared to ambient noise levels?
The valley has very low ambient noise levels. Currently, the thresholds for non-compatibility for residential structures is based on the DNL (cumulative noise metric). However, as noted above, it does not reflect what people hear when an aircraft flies over, and the perception of noise can definitely be increased when the ambient noise levels are low. While there are no thresholds relative to this, this is one of the reasons why we will be analyzing impacts with single event metrics.

What percentage of aircraft can fly RNP?
We don't know with exact certainty the percentage of aircraft currently operating at the Airport which are equipped with RNP. Most newer aircraft and those now coming into service are equipped. We estimate that about 40% of current commercial jets are equipped, but a very small percentage of current GA aircraft (10-20%), are equipped. However, it is important to note that having the hardware is not enough; the aircraft operator must also pay for and install the software on which it operates. We expect over time to get more of the newer equipped aircraft into the JAC fleet and that RNP will become more commonplace in the coming years.

Why was the 1983 Agreement amended in 2011, and what would have happened if its term had not been extended?
FAA requires that an airport demonstrate that it has "good title" to the airport property and thus able to operate and maintain the improvements constructed with federal financial assistance through the anticipated useful life of those improvements. For airports, like JAC, that operate under a lease with a property owner that is not also the airport operator, the FAA historically has required that the lease have at least 20 years remaining on the term in order to award grant funding. The Use Agreement was amended in 2011 because the Airport was getting close to having less than 20 years remaining on its term. Had the 1983 Agreement not been amended to extend its term, the Airport would not have been eligible for FAA grant funding starting in 2013.

Could we look at more departures to the north?
The preferred directions as stated in the 1983 Agreement include arrivals from the south and departures to the south, when it is safe to do so. Those preferences were established to protect the Park's Noise Sensitive Area and Critical Area, as seen in the graphic below. Any increase in takeoffs to the north would substantially increase noise in these sensitive areas of the Park (Black Tail Butte substantially limits departures that direction and aircraft can't turn earlier to direct it away from the Park). For this reason encouraging a northern departure procedure will not be considered.



Will you evaluate both residential and other noise sensitive uses (such as Elk Refuge, etc.)?
Yes. One Task Force member described the Valley as a "String of Pearls," which is an apt description of the constraints in the Valley that include Grand Teton National Park, the Elk Refuge, terrain constraints, as well as private residences. It will be important to analyze the impacts relative to both private residences and public lands in the area. It is also important to note that any proposed procedures that might come out of this Study will also be subject to evaluation under the National Environmental Policy Act (NEPA). NEPA impact analysis and documentation will need to occur prior to implementation.

Can we look at fanning of procedures?

We anticipate that more than one procedure to the south may be developed, with selection of which procedure to actually fly being dependent on destination, ATC, weather, aircraft climb performance, the equipage of the aircraft and pilot training. Each procedure would also have a lesser level of built-in dispersion depending up the type of aircraft, the flight management computer, climb performance and pilot activities. Different procedures, with some dispersion built-in to each procedure, would have the effect of "fanning" the departures.

Can you put teeth to the voluntary Fly Quiet Program?

The Fly Quiet Program was designed to have the maximum effect without violating applicable legal standards. Congress and the FAA repeatedly have concluded that a patchwork of local restrictions would seriously undermine the national air transportation system. Mandatory restrictions may be found to violate the U.S. Constitution, federal law and the contractual commitments made by the Airport Board in exchange for federal grant funding.

Most significant among these restrictions is ANCA, mentioned above. ANCA, and its implementing regulations, are very clear that virtually any type of mandatory restriction on aircraft noise must receive FAA approval. Since 1990, the FAA has approved no new restrictions under the law.

Again, the Fly Quiet Program is based largely on positive reinforcement and public recognition, which have proven effective at other airports. The Airport is open to all ideas relative to providing greater encouragement for operators to fly quietly.

Can the Airport Board increase landing fees on private jets to a level where they may consider using an alternate airport?

No, for two reasons. First, the contractual commitments agreed to by the Airport in exchange for federal grant funds require that airport fees must be reasonable and nondiscriminatory. To ensure compliance, airports like JAC traditionally calculate fees to correspond to the airport's cost to accommodate users (e.g., landing fees offset the cost to improve and maintain the airfield). The FAA may find that adjusting fees based on noise levels is unreasonable and unjustly discriminatory. Second, ANCA treats any airport fee structure design to control noise to be a "restriction" that requires FAA approval. As explained above, FAA has clearly signaled that it disfavors such efforts and almost certainly would deny any request by the Airport Board.

Is it possible for the Airport Board to require a contract with operators like NetJets similar to the airlines?

Airlines are tenants that rent space in the terminal building and maintain a base of operations at the Airport. NetJets and similar operators, regardless of how often they use the Airport, are transient operators. These transient operators cannot be made to enter into an agreement prior to using a federally-funded airport.

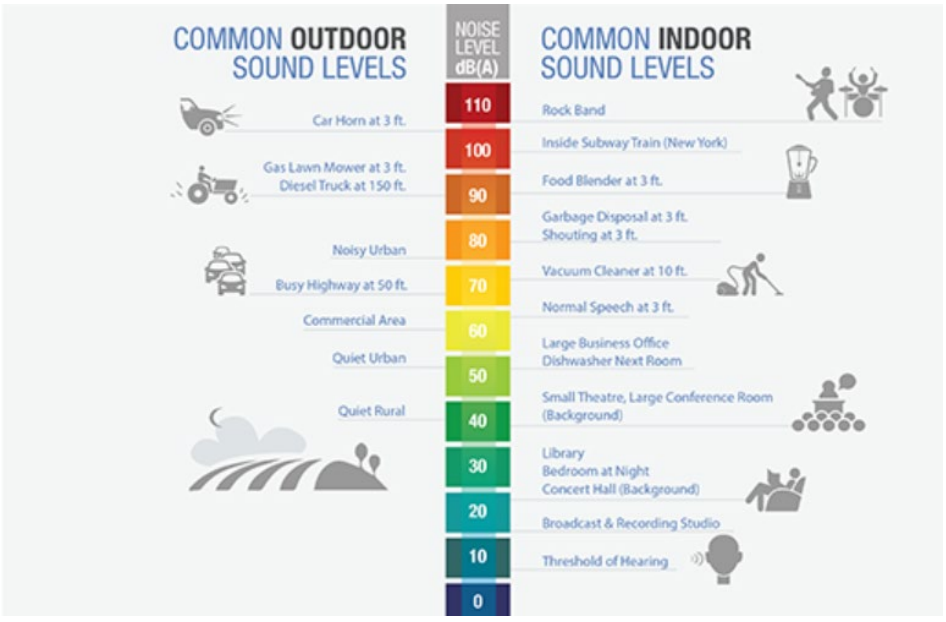
If the Airport Board submits a procedure to FAA, it must first go through the NEPA process for environmental approval. Can you provide more information on the NEPA process?

The National Environmental Policy Act (NEPA) states that for any major federal action a NEPA evaluation must be prepared. Because a flight procedure change qualifies as a federal action, the FAA must prepare NEPA documentation consistent with their internal guidance. The FAA may delegate this responsibility to the airport sponsor for preparation (to be reviewed and approved by FAA), or the FAA may prepare the documentation internally. If FAA completes the document, which is typical for procedures, they fund the effort. The level of NEPA analysis is dependent on the potential impacts. There are three levels of NEPA documentation: a Categorical Exclusion which can take 1-3 months, an Environmental Assessment, which can take 12-18 months, and an Environmental Impact Statement (EIS) which could take two years or more. Note that special purpose laws such as Section 4(f) of the U.S. Department of Transportation Act must be considered in the NEPA analysis and could potentially delay schedule.

What is the threshold for noise for NEPA?

As described earlier, the thresholds for non-compatibility for residential structures (and other noise-sensitive uses) is based on the 65 DNL (cumulative noise metric). In this Study, our analysis is based on single event metrics, which is measured as dBA. It is important to note that 65 dBA is not the same as 65 DNL, DNL is a cumulative metric that is used by the FAA to determine compatibility with noise. Any noise below 65 DNL is considered compatible with residential and other noise sensitive uses. The 65 DNL noise contour does not currently contain any residences or other sensitive noise uses.

The 65 dBA is NOT a threshold for compatibility. As discussed in the meeting, the 65 dBA was used as a comparison for an approximation of typical conversation. Below is a graphic that shows single event noise and an approximation of the type of sound.



Source: FAA Fundamentals of Noise and Sound website, https://www.faa.gov/regulations_policies/policy_guidance/noise/basics

For this study, we are using dBA to show relative change in the single event noise over certain areas, as it is a method to show relative increases and decreases for aircraft events relative to a standard of perceived change. The human ear typically can perceive a change in sound over 3 dBA.

If 65 dBA is not a threshold, then how are the procedures being evaluated?

The procedures are being evaluated by comparing each procedure concept to the existing ALPIN and the identifying the relative change (under 3 dBA, 3-9 dBA or over 10 dBA change) at various areas in the community.

The evaluation criteria for this Study are whether the procedure will PERCEIVABLY increase or decrease noise, as detailed above (above 3 dBA change would be perceivable, and about 10 dBA would be very noticeable). All concepts resulted in a shift of noise at one or more of the noise evaluation sites within the community and public lands, resulting in an increase at some sites and a reduction at others.

What happened to the ZIPET procedure?

After the May meeting, it was commented that ALL the procedures would shift noise and that it may be advantageous to have one procedure option that evaluated the status quo. Therefore, the ZIPET was modified to be consistent procedure with the existing ALPIN so that all procedures could be evaluated compared to an existing RNP procedure and the KICNE ONE proposed by the FAA.

Is there a way to consider that ambient noise is different in different locations (i.e. that Town may have higher ambient noise)?

While certain areas might have higher ambient noise, for all the concepts, the noise analysis showed that there is an increase in 10 dBA or more in at least one location. Perceived change is relative to the change itself (the aircraft event), not the change over the ambient. An area could have a higher ambient level, but a 10 dBA change would still be considered very noticeable.

However, we appreciate that ambient noise levels are of interest and a column will be added to the grid that illustrates Noise Levels at Sample Locations to show the ambient noise level (L50) at each location based on additional monitoring to be completed.

A maximum noise level (such as a loud car event, separate from aircraft events) will not be included in the analysis because it is not a reasonable comparison for this Study's purpose. The purpose is to evaluate the change relative to the potential procedure concepts (ALPIN compared to the concepts). Therefore, a maximum noise level from other sources (separate from aircraft) is not a relevant comparison for analysis in this Study.

Is it possible to limit size of aircraft and/or number of flights per day?

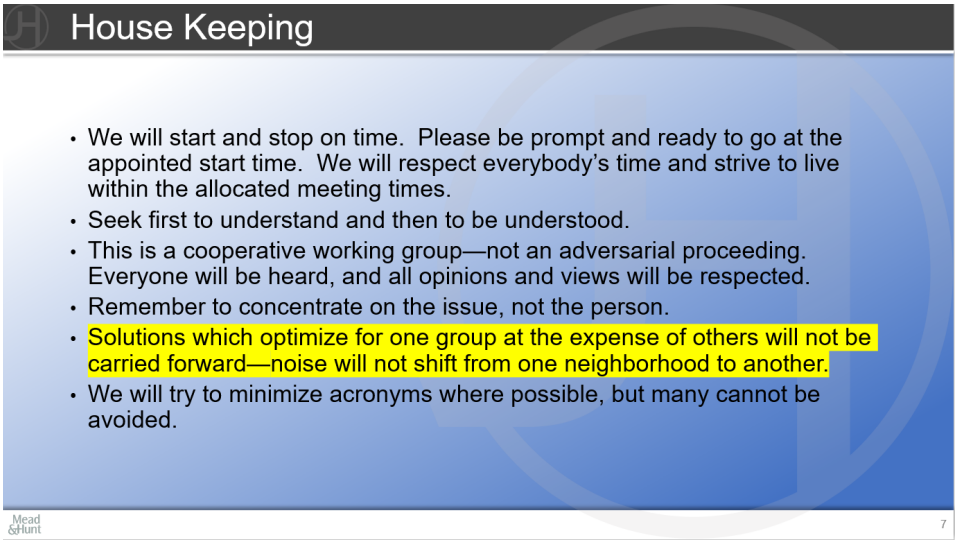
No, the contractual commitments agreed to by the Airport in exchange for federal grant funds require that a public airport (i.e., Jackson Hole Airport) must provide access to all airport users and cannot discriminate against any user. Under FAA requirements, the airport must be available to all that have interest in using the airport. To require limitations based on aircraft type or number of flights would be considered discrimination.

What are the objectives and ground rules of the Southern Departure Procedure Task Force?

As presented in the first Task Force meeting on February 10, 2022, the objectives of the Task Force are to:

- Gain a common understanding of the physical, environmental, and regulatory context for operations at the Airport.
- Gain a common understanding of the history of flight operations and southern departure options used and considered in the past.
- Review the Airport's history of noise abatement as it relates to both northern and southern procedures for commercial and general aviation operations.
- Identify and prioritize possible improvements to southern departures that will reduce aircraft noise intrusion.

Ground rules for the Task Force included guidance on how to operate as a Task Force and reinforced that that the mission of the Study was to evaluate concept procedures to see if there was an opportunity to reduce noise impacts on the community and public lands. It was made clear that solutions which optimize for one group at the expense of others will not be carried forward—noise will not shift from one neighborhood to another.



Southern Departure Task Force Presentation on February 10, 2022, Slide 7

Can you initiate a turn at 400' vs 500'?

Right now, based on FAA requirements if you are flying an RNAV procedure you must wait to initiate a turn until 500'. In the future the FAA may be looking to lower this below 500' but it would take years in the making for this to occur. However, the difference in noise from 400' and 500' in would likely be marginal (not perceivable). The 400' in question is only for a conventional departure procedure where aircraft may initiate a turn at 400'.

Useful Aviation Acronyms

AC	Advisory Circular
AEDT	Aviation Environmental Data Tool
AEOZ	Airport Environs Overlay Zone
AFE	Above the Field Elevation
AGL	Above Ground Level
AIA	Airport Influence Area
AIM	Airmen Information Manual
AIP	Airport Improvement Program
ALP	Airport Layout Plan
ANCA	Airport Noise and Capacity Act of 1990
ANSI	American National Standards Institute
AOA	Airport Operations Area
ARTCC	Air Route Traffic Control Center
ASNA	Aviation Safety and Noise Abatement
ATC	Air Traffic Control
ATCT	Airport Traffic Control Tower
ATO	Air Traffic Organization
AURs	Airport Use Regulations
CAT	Category
CDA	Continuous Descent Approach
CFR	Code of Federal Regulations
CIP	Capital Improvement Program
CVRP	Curfew Violation Review Panel
dB	Decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
DNL	Day Night Average Sound Level
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FBO	Fixed Base Operator
GA	General Aviation
GIS	Geographic Information System
GPS	Global Positioning System

FICAN	Federal Interagency Committee on Aviation Noise
FICON	Federal Interagency Committee on Noise
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
LDA	Landing Distance Available
Leq	Equivalent Noise Level
Lmax	Maximum Noise Level
LOC	Localizer
NAS	National Airspace System
NAVAIDS	Navigational Aids
NBAA	National Business Aviation Association
NCP	Noise Compatibility Program
NEM(s)	Noise Exposure Map(s)
NEPA	National Environmental Policy Act
NM	Nautical Mile(s)
NPIAS	National Plan of Integrated Airport Systems
PBN	Performance Based Navigation
RNAV	Area Navigation
RNP	Required Navigation Performance
ROA	Record of Approval
RWY	Runway
SEL	Single Event Level
SID	Standard Instrument Departure
TRACON	Terminal Radar Approach Control
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VOR	Very High Frequency (VHF) Omni-Directional Range
VORTAC	Very High Frequency Omni-Directional Range Tactical Air Navigation