



## 2018-2019 Biennial Report

# Executive Summary



This Biennial Report is submitted to the National Park Service (NPS) under Subsection 13(h) of the 1983 Agreement between the United States Department of the Interior and the Jackson Hole Airport Board. It describes the Airport Board's activities and operations for the 2018 and 2019 biennium, and its effort to provide leadership in sustainability and reduce environmental impacts of airport operations on Grand Teton National Park and surrounding areas.

In 2018, the Airport Board increased its focus on sustainability and resiliency and achieved substantial gains in this area. Listed on the following page are a summary of the accomplishments for 2018-2019.



## Highlights of Accomplishments

---



- Adopted Waste Policy and Waste Diversion Goal (Resolution No. 2019-03)
- Awarded a Volkswagen Settlement Grant (\$173,474) to reduce air pollution
- Initiated a pilot composting program at the Airport restaurant, Jedediah's
- Completed a baseline Greenhouse Gas Emissions Inventory and Report
- Initiated the Jackson Hole Airport Good Traveler Program (for carbon offsets)
- Joined the Rocky Mountain Institute Good Traveler Advisory Board
- Added Electric Vehicle Charging Stations (8 stations available for public use)
- Joined US Environmental Protection Agency Green Power Partnership Program
- Completed wetlands mitigation work in Grand Teton National Park (the Park)
- Updated the Spill Prevention, Control and Countermeasures document (SPCC)
- Initiated the Fly Quiet Program as a recommendation from the Part 150 Noise Study
- Installed an Automatic Dependent Surveillance – Broadcast (ADS-B) extender to provide improved radar coverage and efficiency for use in the noise system.



- Named as Best Tiny Airport in the World by Fodor's
- Recognized as "Large Business of the Year" by the Jackson Hole Chamber of Commerce
- Achieved Business Emerald Sustainability Tier (BEST) Certification (97%)
- Awarded the Balchen Post Award by the American Association of Airport Executives (AAAE) at the 2019 Annual Snow Symposium
- Kody Jeppson, Jackson Hole Airport (JAC) Operations Officer, named Snowplow Operator of the Year by the AAAE at the 2019 Snow Symposium
- Created 'Sustainability Focus Group' for Airport stakeholders
- Created a Sustainability Management Plan (SMP)
- Created the JAC Sustainability Accomplishments Report
- Developed the 'Airport Sustainability Assessment Tool Project' in cooperation with the University of Wyoming Haubs School of Environment and Natural Resources to help track sustainability goals



- Completed construction of a Stormwater Detention and Filtration System
- Completion of new Fuel and Glycol Storage Facility
- Completion of new Quick-Turn-Around (QTA)
- Closed out final Underground Injection Control (UIC) permits
- Completed radon mitigation project (Terminal basement)



## TABLE OF CONTENTS

Cover Letter	<i>i</i>
Executive Summary	<i>ii</i>
Introduction	1
	<b>ENVIRONMENTAL</b> 2
	Existing and Ongoing Noise Mitigation Measures
	Waste Management and Recycling
	Air Quality and Emissions
	Energy and Power
	Water
	Wildlife Management
	Visibility and Screening
	<b>COMMUNITY AND EMPLOYEE PROGRAMS</b> 21
	Certifications and Awards
	Collaborations
	Employee Benefit Program
	<b>RESILIENT RESOURCE</b> 25
	Operations
	Airport Planning
	Facility Improvements
	Security and Screening Updates
	Financial Management and Planning
	<b>CONCLUSION</b> 36
	<b>APPENDICES</b>
	A. Board Organization and FAA Obligations



# Introduction

Federal statutes authorize the Secretary of the Interior to enter into agreements with public agencies, such as the Jackson Hole Airport Board (the "Board"), for the operation of airports in or near national parks. Pursuant to that authority, the Department of the Interior (the "Department") and the Board entered into an Agreement dated April 27, 1983 (the "1983 Agreement"), for the operation of the Jackson Hole Airport (the "Airport" or "JAC") in Grand Teton National Park (the "Park"). The 1983 Agreement was originally set for a term of 30 years and granted the Board two 10-year options to renew.

Federal law requires that an airport have a remaining lease term of at least a 20-years to remain eligible for FAA grants. Therefore, in 2011 the Department and the Board entered into a Third Amendment to the 1983 Agreement which added two additional 10-year options to renew (the "Amendment"). The Board has exercised the first of these two options, thereby extending the term through April 27, 2043. The text of the amendment is included at the end of this report, and the suite of mitigation measures included in the Jackson Hole Airport Agreement Extension FEIS is included in the appendix of this report.

The Amendment expanded the Board's obligations to work in good faith and in coordination and cooperation with the National Park Service (NPS) to develop and implement reasonable and cost-effective mitigation measures as may be available to reduce environmental effects on the Park. The Board has taken this obligation further with a renewed and increased focus on sustainability.

Representatives of the Park, Airport management and members of the Airport Board meet quarterly to track progress on initiatives and to increase continued collaboration between the two bodies.

The Amendment also requires the Board to submit to NPS a report describing the Board's activities and operations during the previous two calendar years, its efforts at reducing negative environmental impacts, and specifically, its efforts to reduce noise impacts on the Park.



This is the fifth Biennial Report submitted under this requirement and covers the Board's activities and operations during calendar years 2018 and 2019. It highlights those elements which enhance the sustainability and resiliency (the ability to plan for and adapt to change) of the Airport and its community.



# Environmental



The Jackson Hole Airport Board is dedicated to becoming an industry leader in environmental stewardship, green building initiatives, and sustainability. In an effort to preserve the power of place for future generations, it has and will continue to implement environmentally sustainable initiatives at the Jackson Hole Airport. The Board's commitment is to protect our natural environment, the National Park in which the Airport exists, support our local community, and serve as a resource to the unique area it serves.



## Existing and Ongoing Noise Mitigation Measures

**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 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 Board has implemented a range of mitigation measures which are described below. 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 noise sensitive areas of the Park are defined by the critical area boundary, which cannot be exceeded by the 45 DNL noise contour. The noise control plan “... utilizes the latest in noise mitigation technology and procedures. The revised plan will be developed in a comprehensive study to consider all of the relevant environmental, economic, and operational considerations.”

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

- Noise measurement at Moose location cannot exceed 55 DNL annually,
- A defined Critical Area Boundary within the Park, and
- Aircraft single event noise limit on approach is 92 dBA (as defined by the approach dBA level from Advisory Circular 36-3H).
- To meet the above requirements of the 1983 Agreement, the Airport Board developed an Airline Access Plan. The Airline Access Plan was grandfathered by the Airport Noise and Capacity Act of 1990. This 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 Airline Access Plan include maximum noise level limit, cumulative noise standard, aircraft operating procedures, operations specifications amendment for scheduled passenger service airlines, requirements for aeronautical contractors, noise complaint/inquiry report system, and educational efforts. The 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 quieter Stage III aircraft have been the only aircraft permitted to operate at the Airport. 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.

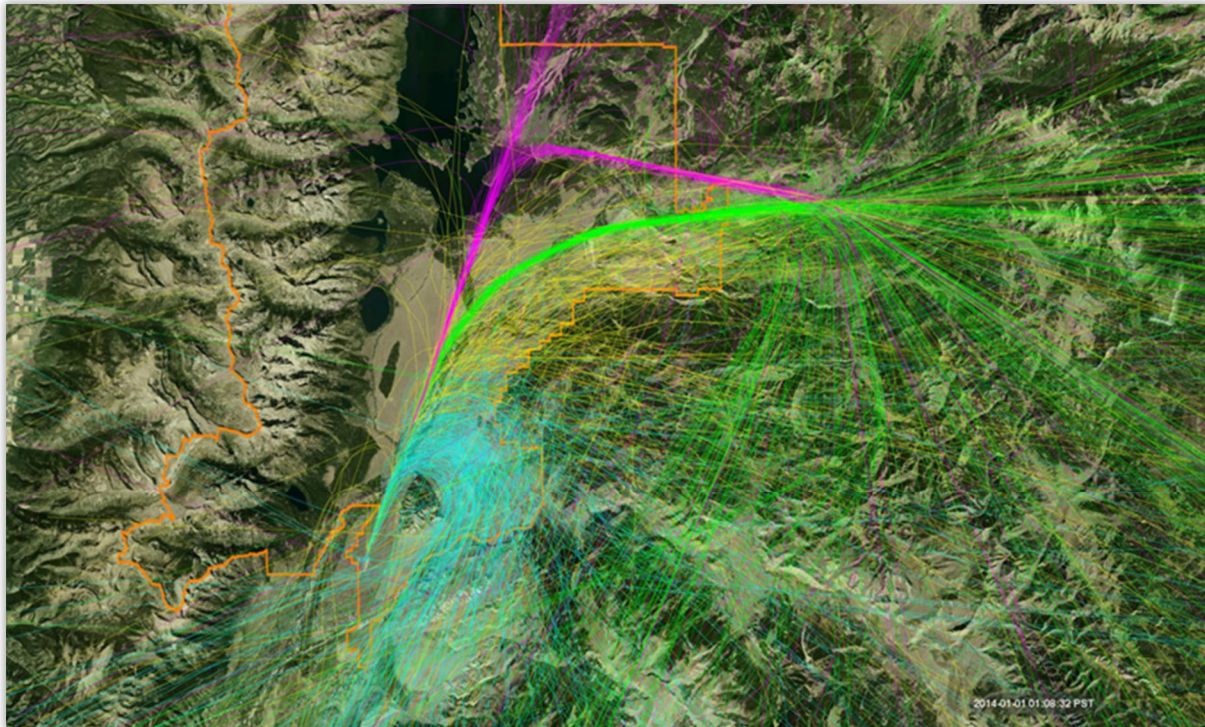
- **Summary of 2018-2019 Noise Measurements and Modeling**
  - Noise Monitoring System Updates
  - Day Night Level
  - Annual Average Daily Departure
  - Single Event Levels and Preferential Runway Use
  - Voluntary Curfew
  - Summary of Noise Monitoring Results and Trends
- **Development of Measures**
  - NextGen
  - Fly Quiet

**Summary of 2018-2019 Noise Measurements and Modeling.** The 1983 Agreement noise abatement measures are tracked using noise measurements and modeling that is completed annually and have evolved to be more sensitive and comprehensive over time. Enhancements to the monitoring system include integrating radar and flight information (to correlate aircraft and noise events), low noise microphones, weather sensors, the ability to measure the 1/3 octave spectra, and the measurement of detectability. The “detectability” measurement is used to show the audible contribution of aircraft and other noise sources to the Park’s natural quiet.



This allows the system to better quantify aircraft audibility levels at these locations. Based in part on these noise measurements, the Board's noise consultant, BridgeNet International, produces a noise report each year. The results are presented on a first of its kind, three-dimensional display of aircraft noise and aircraft flight paths that is available on the Airport's website and are also summarized below.

**Noise Monitoring System Updates 2018/2019:** An ADS-B extender was installed at the Airport to provide improved radar coverage for use in the noise system. ADS-B is the FAA's NextGen radar surveillance, and the extender allows the Airport to have very accurate coverage of aircraft operations (landings and take offs) down to the airport surface elevation, including aircraft taxiing on the airfield, that can be used in the noise monitoring system. This new ADS-B surveillance provides improved tracking of aircraft flying over or near the Park and provides identification to most operators that was not available in the past.



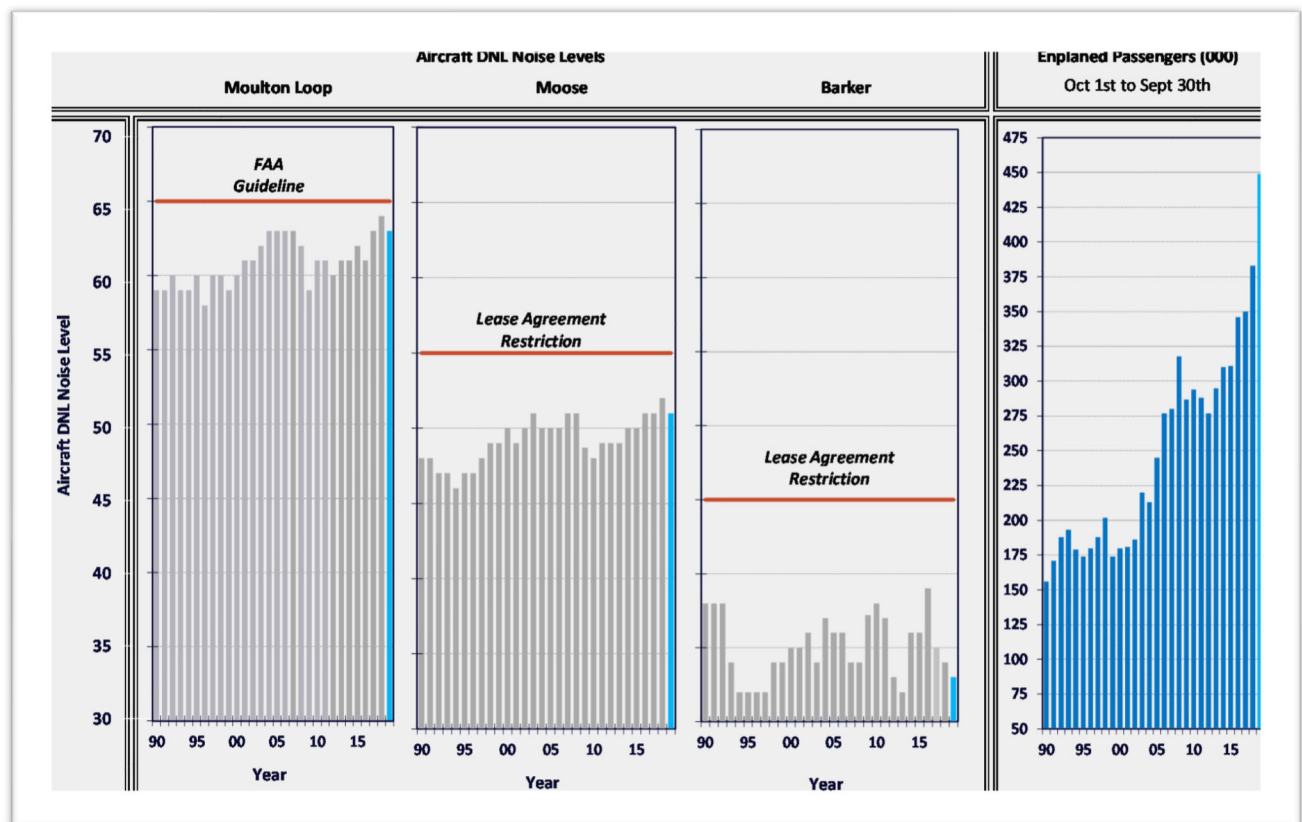
*Data from the BI-6 and ADS-B radar can be used to record flight paths, identify approach types, and provide nearly real time flight tracking with noise contour modeling of individual aircraft.*



## 2018/2019 Noise Monitoring Results: DNL Levels

- The 65 DNL (average day/night noise) contours did not extend beyond the Airport boundary, and therefore no residential or other non-compatible land uses (as defined by FAA) were exposed to 65 DNL.
- Passenger enplanements have increased, while operations and noise levels have remained relatively steady for the same period. This represents the combination of quieter, more efficient commercial aircraft paired with greater capacities to account for the increase in passengers. Additionally, the success of procedural changes and Fly Quiet measures also reduces noise around the Airport. These factors allow JAC to serve more passengers without an increase in DNL.
- The graphs shown below indicate the Airport is well within compliance of the standards specified by the FAA and contained within the 1983 Use Agreement. The orange horizontal lines indicate these limits. Note that the Fly Quiet report period is from October to September and may not reflect *annual* operation numbers.

## Fly Quiet DNL (October 2018 to September 2019)





### 2018/2019 Noise Monitoring Results: Annual Average Daily Departure

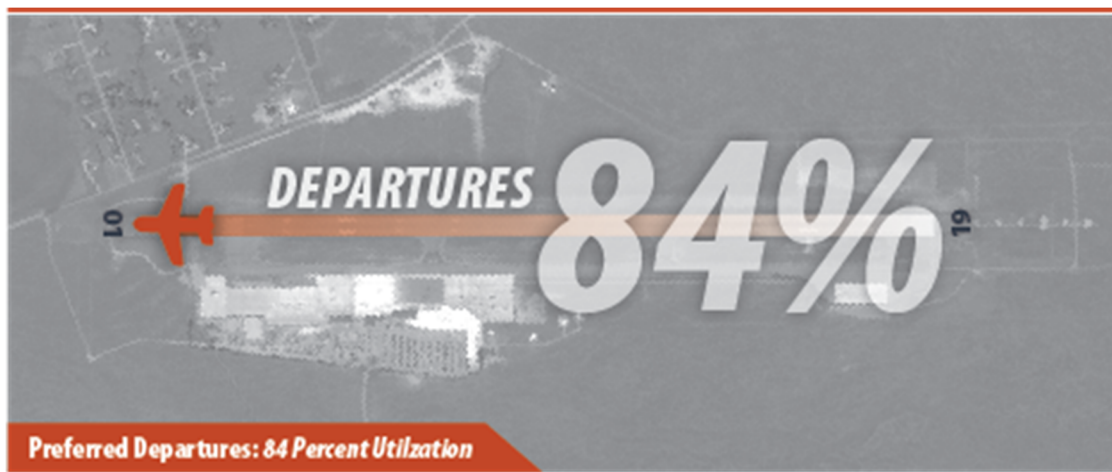
- Based on advances in aircraft noise technology since 1984, the 45 dBA (A-weighted decibels) and 55 dBA DNL contours have never been exceeded and the number of average daily departures has remained below the specified limit of 6.5 “Base Class” aircraft equivalents.
- Annual Average Daily Departures (ADDs) for 2018 were 3.29 and for 2019 were 4.14, which are below the 1983 Agreement stated operational limit of 6.5 ADDs averaged annually (quarterly annual average daily departures).

### 2018/2019 Noise Monitoring Results: Single event level (Departure) and Preferential Runway Use

- Aircraft cumulative DNL noise levels within the Park were more than 4 dBA below the noise levels specified in the 1983 Use Agreement.

The 1983 Agreement requires the Board to take reasonable measures to notify aircraft operators to avoid noise-sensitive areas of the Park, and to encourage aircraft to utilize approaches from and takeoffs toward the south on the Airport’s single runway. Such approaches and takeoffs would avoid overflying any part of the Park which is outside the noise sensitive boundaries established in the 1983 Agreement. The procedures indicate that Runway 01 (from the south) is the preferred arrival runway and Runway 19 (to the south) is the preferred departure runway, when safety permits its use. In 2018/2019, 84% of aircraft utilized the preferred departure runway, (Runway 19 departing to the south) with departures being the noisier operation; 16% of aircraft utilized the preferred arrival runway (Runway 01 landing from the south). The prevailing wind direction is from the south, so the primary flow is departures to the south and arrivals from the north. The preferential runway use can result in head to head operations where aircraft would depart to the south and land from the south. Due to traffic, head to head operations during busier times are discouraged, and landing on Runway 01 when aircraft depart on Runway 19 does not occur as often as in the past. The Board will continue to work with FAA and the control tower to attempt to improve preferential runway use.

### Preferential Runway Use 2019

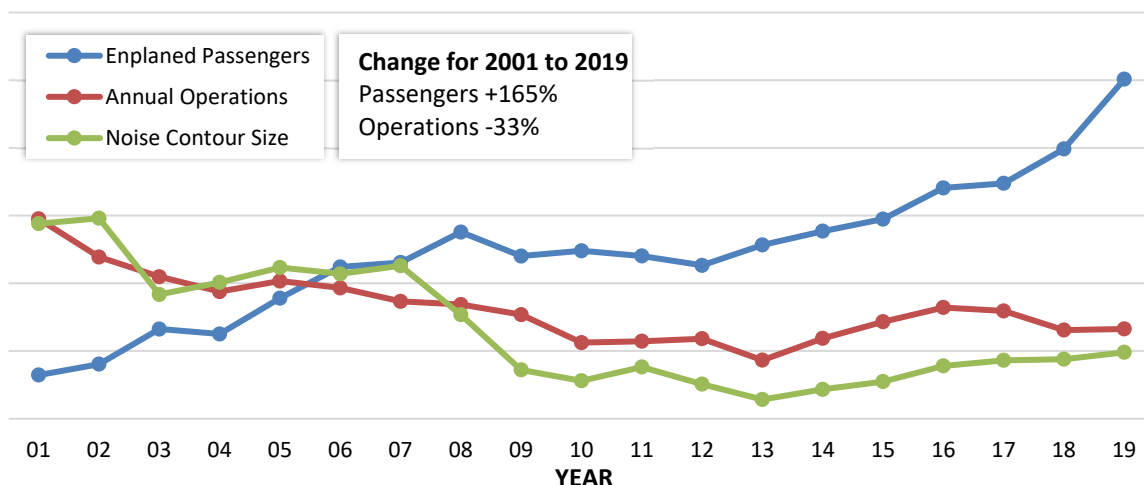




- **Voluntary Curfew.** Under the Airport Noise and Capacity Act passed by Congress, the Board cannot unilaterally impose a mandatory curfew without FAA approval. The Board has nonetheless adopted a voluntary curfew for general aviation aircraft between 11:30 p.m. and 6:00 a.m. for landing, and between 10:00 p.m. and 6:00 a.m. for takeoff. Pilots also are advised that the Airport and tower are not staffed overnight, that fire/rescue and other services are not available during this period, and in winter, the runway, taxiway, and ramp are not plowed after the last scheduled passenger flight arrives, so that incoming planes risk landing on a snow-covered runway. The Airport receives a report from Flight View with N-numbers that allow staff to look up the addresses and companies that operate during the voluntary curfew (with the exception of life-flights). Any aircraft that do not conform to the voluntary curfew are sent a notification letter. Although the curfew is voluntary, the Board finds that the letter notifications substantially reduce the number of nighttime operations during the curfew.

**Summary of Noise Monitoring Results and Trends.** Total aircraft operations have been trending downward over the past 20 years, with only a small uptick this past year. This, along with improved engine technology and a change in fleet mix, has contributed to lowering the overall noise contour size (see graphic below). While total aircraft operations have been trending down, in the past few years the number of commercial operations has increased, but at a much slower rate than the number of passengers has increased. This is driven primarily by a shift in commercial aircraft types. JAC has seen a move away from smaller capacity (19-30 seat) turbo prop aircraft to larger regional jet and mainline jet aircraft ranging in capacity from 70 – 187 seats. JAC has also seen improvements in load factor, which is a measurement of how much seating capacity is being utilized. For example, a flight with an 80% load factor utilizes 80% of its seating capacity. The combination of higher capacity aircraft, with a more efficient use of that capacity, has allowed the Airport to serve more passengers with less environmental impact.

### Historical Passengers, Operations and Noise (2001 to 2019)





**Developing Measures: NEXTGEN.** Previously the Board worked extensively with the FAA and the Park to provide a “NextGen” satellite-based precision procedure that makes the landing path to Jackson Hole safer and shorter, while avoiding most noise sensitive areas of the Park. NextGen is an umbrella term for the FAA's ongoing transformation from a ground-based to a satellite-based system of air traffic management. NextGen is designed to increase safety while reducing environmental effects. When fully implemented, NextGen will allow aircraft to safely fly closer together on more direct routes. Because routes are more direct, and there are reductions of delays both in the air and on the ground. These benefits should accordingly reduce carbon emissions, fuel consumption and noise.

A NextGen approach to Runway 19 was approved by the FAA in March 2013. When it was sanctioned and adopted, it was the first instrument procedure in the United States with a curved approach component designed for noise abatement purposes. ***The Global Positioning System approach is being used by approximately 93% of jet aircraft flying Instrument Flight Rules approaches to Runway 19 (57% of all Runway 19 jet arrivals).*** This GPS approach was prominently featured on the cover of the FAA’s NextGen webpage as an example of using NextGen technology for Noise Abatement.

**New to 2018/2019, the FAA Air Traffic Division is in the early stages of designing new flight procedures at Jackson Hole Airport. These procedures are designed to include noise abatement goals developed within the Part 150 Study (with the goal to reduce noise). These procedures provide for noise abatement benefits by shifting noise further to the east and away from the core areas of the Park and provide for reductions in CO2 emissions. The procedures are developed under specific flight procedure design criteria that comply with safety and terrain separation standards. Once the designs are complete, they will also undergo an environmental analysis prior to implementation.**

**Developing Measures: Fly Quiet Program.** Fly quiet programs are custom tailored environmental compliance plans to encourage airlines, business jet operators (single and fractional owners) and private pilots to operate as quietly as possible at an airport. The primary purpose of a fly quiet program is to foster a participatory approach to complying with existing noise abatement procedures and objectives by including stakeholders in the process from the beginning. For instance, such a program could provide that each airline and corporate jet operator with a minimum number of flights would be graded and ranked on their performance; these scores would then be available to the public via the Airport’s website, newsletters, publications and public meetings. It would also show whether an operator is working to improve its performance and ranking. The overall goal of such a program would be to influence airlines and corporate operators to fly as quietly as possible at the Airport and over the park and adjacent lands.

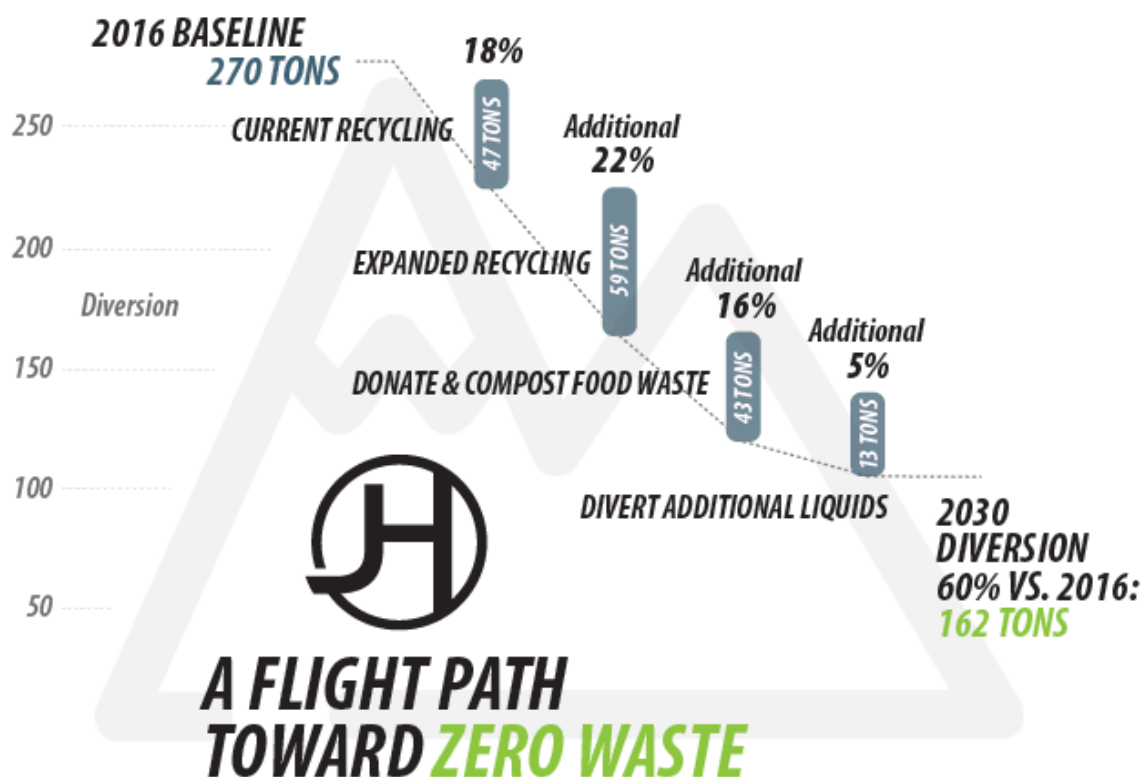
The development of a Fly Quiet Program for the Jackson Hole Airport was approved in the Part 150 Noise Study and the development process has begun. A Fly Quiet Committee has been formed, goals developed, and ranking metrics identified. Additionally, aircraft tracking and fleet mix evaluation have been initiated.



## Waste Management And Recycling

**Recycling.** In the 1990s, the Board, with the support of all tenants, started a small recycling program. This program has grown from a limited number of recyclables to a broader program in partnership with the Teton County Integrated Solid Waste & Recycling Center (ISWR). There are currently six multi-stream recycling stations available in the Terminal for recycling aluminum, #1 plastic, and newspaper. The Airport also recycles cardboard, white paper, glass, magazines, textiles, fluorescent bulbs, ink/toner cartridges, batteries, e-waste (electronic devices, parts and equipment) and bear spray.

In 2018, JAC conducted a waste audit and developed a Waste Management Plan. Aligning with local organizations to pursue the objective of net zero waste, the Board approved an ambitious goal called the Flight Path Toward Zero Waste: a goal of 60% diversion by 2030 (compared to the 2016 baseline).





Strategies for waste reduction were identified in the waste management plan. The items for FY 2019 and FY 2020/2021 are identified below, as well as the progress made to date.

***The most notable successes include the implementation of a pilot project for composting at Jedediah's, the approval to build and install new, uniform waste/recycling bins to aid the public in making the right choice with recyclables, and completion of a new waste tracking tool.*** Of the 14 items on the list for the three-year period, seven have been completed, and **ALL** of the initiatives have been started as of the end of 2019. JAC will track diversion in 2020 to check the success of these programs and identify additional measures to build on the progress already made in this area.

#### **FY 2019**

##### **→ Program Management**

- Officially adopt **60% reduction by 2030 goal**  
→ **Completed: February 2019 - Resolution No. 2019-03**
- Integrate waste diversion into contracts  
→ **Completed for Concessions 2019: Additional contracts in review**
- Begin coordination with airlines  
→ **Initiated Spring 2019**

##### **→ Waste Reduction**

- Expand food donation program  
→ **Completed: Added additional food collection during holidays, expanded signage**
- Decrease brochure waste  
→ **Coordination initiated with Rental Cars**

##### **→ Recycling**

- Maintain existing recycling program  
→ **Completed**
- Streamline access to compactor/recycling  
→ **Initiated: access concerns/discussions taking place**
- Recycling/liquid diversion in new QTA  
→ **Coordination initiated**



## FY 2020/2021

### → Program Management

- Review financial costs with waste and recycling hauler  
→ ***Coordination initiated***
- Report progress  
→ ***Completed in Biennial Report and the completion of a waste management tracking tool in cooperation with the University of Wyoming Haubs School of Environment and Natural Resources***

### → Waste Reduction

- Right-size bin liners to reduce bag waste  
→ ***Initiated research on bin liners***

### → Recycling

- Install consistent containers and signage  
→ ***Initiated: Trial bins approved by Board in December 2019***
- Implement deplaned waste recycling:  
→ ***Coordination initiated with airlines***

### → Composting

- Compost back of the house food waste from restaurant  
→ ***Initiated: Pilot project completed in conjunction with ISWR and Jedediah's.***

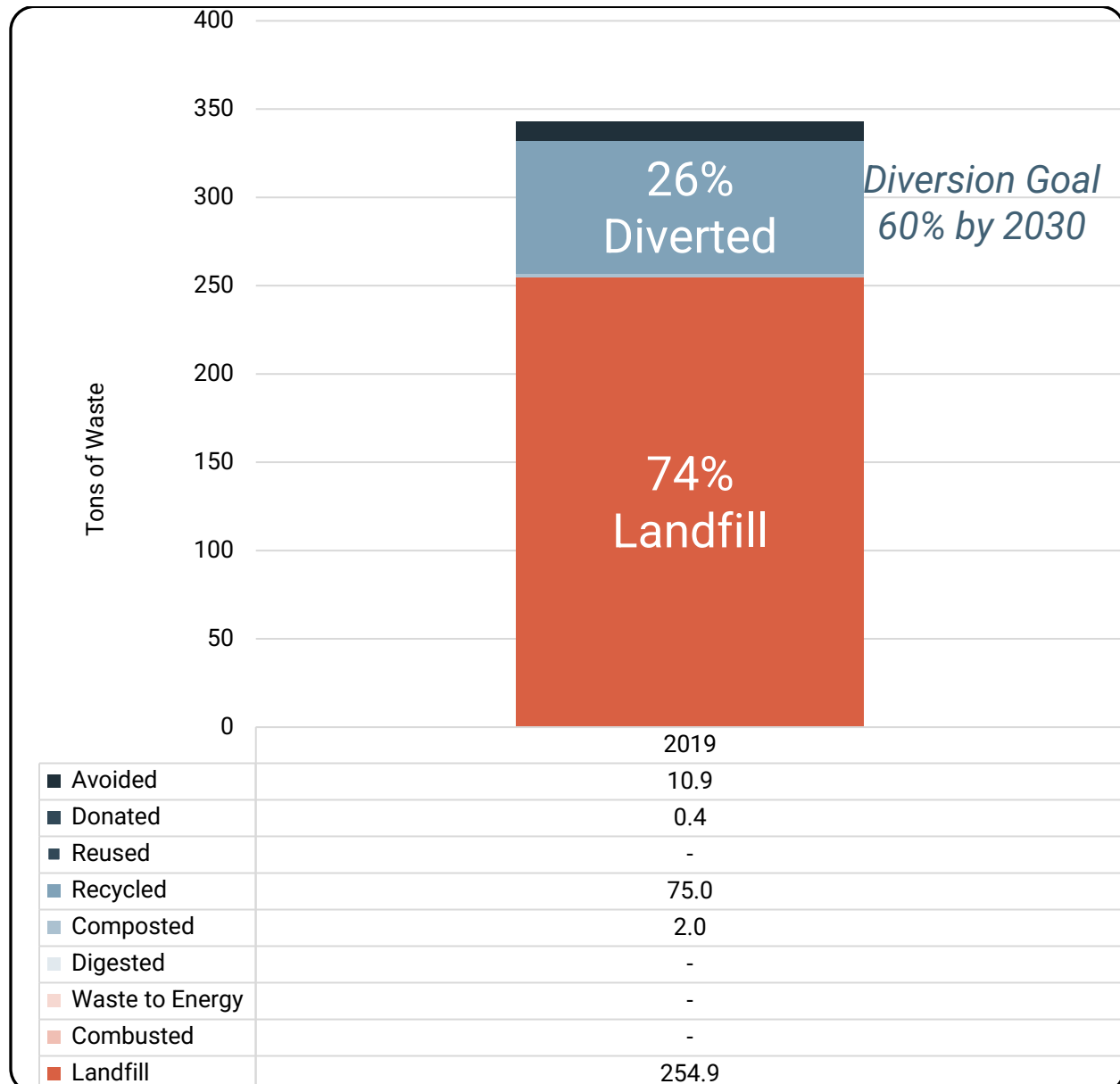
## ***An additional initiative completed (outside the action plan) include:***

- **Bear Spray Rental Program.** Bear spray cannot be taken onto air carrier aircraft. The Airport therefore has bear spray disposal containers in the Terminal to allow passengers to properly dispose of bear spray canisters that have been brought into the Airport. The bear spray canisters are collected and sent to a facility where they are discharged and recycled. New in 2019, the Board also initiated a bear spray rental program in the Terminal, where travelers can rent and return unused bear spray rather than buying and recycling it. While the specific amount of bear spray recycled is not tracked, staff indicate that the rental program has substantially decreased the amount of bear spray in the recycling containers. This is a positive benefit in reducing waste.



**Summary of Recycling and Waste Management Program:** Total diversion rate in 2016 was 18%. The waste tracking tool was completed in summer 2019, with data inputs for June through January. As a result of the initiatives indicated above, the diversion rate was approximately 26% for that period.

#### JAC Waste Diversion and Disposal – June-December 2019

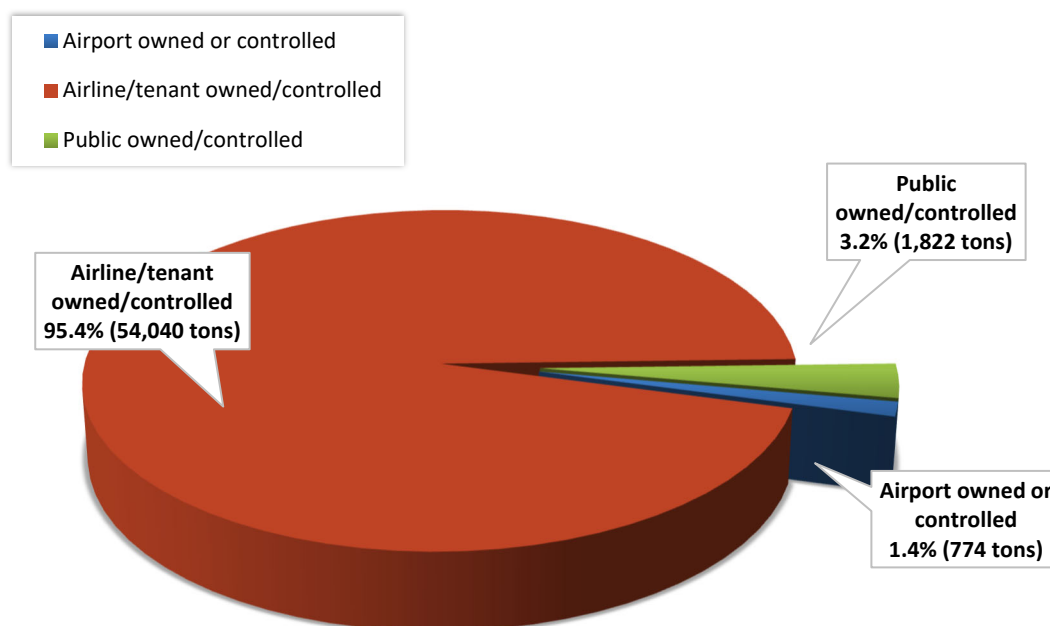




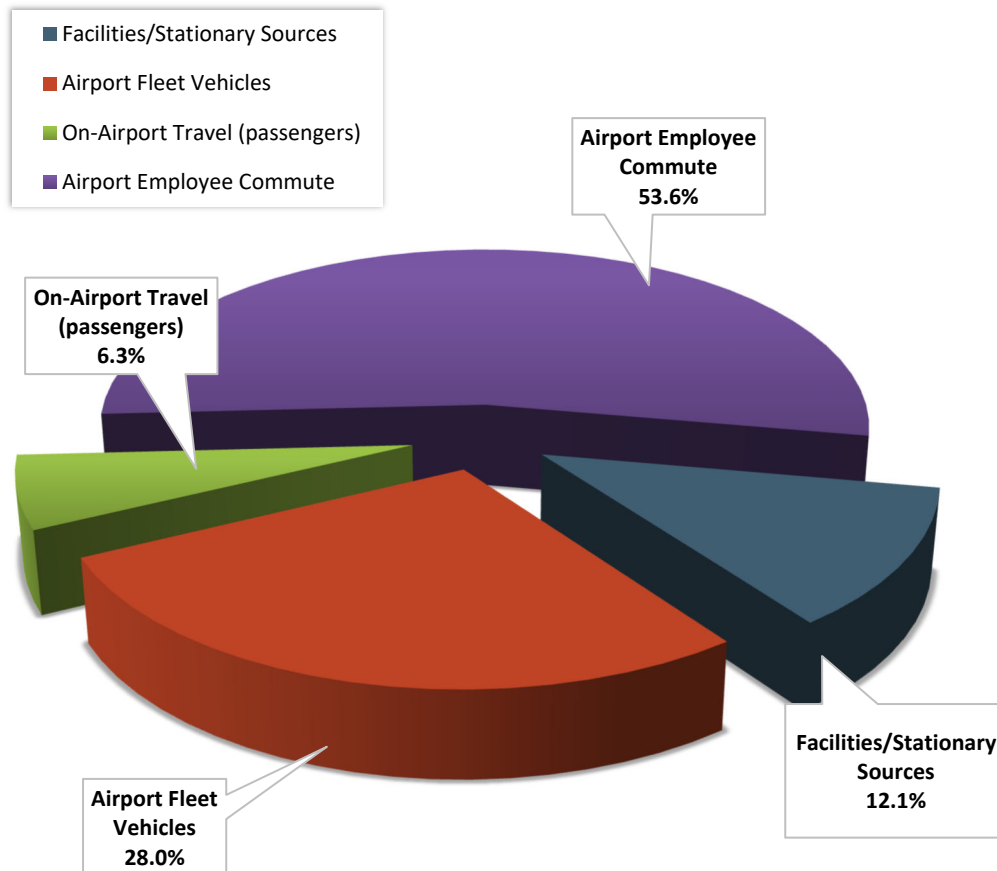
## Air Quality And Emissions

**GHG Emissions Inventory.** In 2018 and 2019, the Airport continued to make headway in employing sustainable measures to reduce their emissions and improve air quality. In 2019, the Airport completed a baseline Greenhouse Gas Emissions Inventory based upon the Airport Cooperative Research Program (ACRP) methodology. The data was based upon 2017 data in order to align with the most recent Teton County GHG Emissions Inventory, which was an update to the County's 2008 GHG report. Of the total 56,363 tons, most of these emissions (95.4%) are associated with aircraft emissions. 1.4% of the emissions (774 tons) are Airport owned and controlled, which includes elements such as employee commute, fleet vehicles owned by the Airport, and facility heating/cooling/lighting. Due to the low emissions factor in the valley (owing to the presence of hydropower), the bulk of the Airport owned sources comes from the employee commute, representing more than 50% of airport owned emissions.

### 2017 Airport-Wide Greenhouse Gas Emissions (56,363 Tons)



### 2017 Airport Sources Owned or Controlled (774 tons)





**Good Traveler Program.** In 2019, JAC became a member of the Rocky Mountain Institute's Good Traveler Program, a program focused on offsetting greenhouse gas emissions associated with travel. As one of the early adopters, JAC joined the advisory board for the Good Traveler Program, which is focused on improving the program. Because such a small portion of the overall GHG footprint is owned and controlled by the Airport, the board decided to take voluntary action to allow individuals flying through the Airport to offset their emissions. Based on current costs, an individual can offset 1,000 miles of flying or 400 miles of driving with a \$2 offset. These offsets are available and advertised through the Jackson Hole Airport Wi-Fi landing page and social media outlets. In 2020, **JAC also offset all airport-controlled emission sources including employee commute, airport fleet and facilities, among other sources.** Additional outreach and partnerships to expand this program are planned throughout 2020. One priority is to identify an eligible carbon sequestration project within the Greater Yellowstone Ecosystem (GYE), in cooperation with the Park.

**Award of Volkswagen Settlement Grant (\$173,474).** In 2019, JAC was awarded a grant from the Volkswagen Settlement totaling \$173,474. These funds were used to replace an inefficient diesel snowblower with a wheel loader and front mounted snow blower with technology improvements and cleaner diesel engines to enable a 69% reduction in NOx emissions.

**Alternate Fuel Vehicles.** The Board has made a commitment to reduce its carbon footprint through several policies. One of these is the purchase and use of alternative fuel vehicles for airport operations. The Board plans to acquire additional alternative fuel vehicles as older airport operations fleet vehicles are retired. In 2018 and 2019, the Airport earned the designation as a GreenFleet through Yellowstone-Teton Clean Cities for consistently updating its current fleet with alternative fuel vehicles. The Airport currently operates two plug-in all-electric maintenance vehicles and two propane-powered maintenance trucks. As part of the 2019 plan, the remaining vehicles in the fleet are going to be screened relative to grant cycles to see if additional vehicles could be switched out for alternative fuel. Additionally, the Airport is working to improve the efficiency of the rental fleet and investigate use of additional hybrid or alternative fuel vehicles.

A promotional graphic for the Good Traveler Program. The top section has a dark blue background with white text: 'Make a 2020 New Year's Resolution for a brighter, merrier planet.' Below this is a small white diamond icon. The middle section has a light blue background with white text: 'Sign up at Good Traveler to offset your carbon emissions. Whether traveling by plane or car, you can affordably offset your Greenhouse Gas Emissions from your trip and help our ecosystem.' Below that is another line of white text: 'JH Airport is thrilled to be a partner airport of the Good Traveler Program.' The bottom section features a stylized illustration of a mountain range, a snow-covered ground, a small airplane flying, and a reindeer. In the center of the illustration is a large, stylized 'W' with a 'JH' logo inside it. At the bottom of the graphic are three logos: the Jackson Hole Airport logo, the 'THE GOOD TRAVELER' logo with the tagline 'LEAVES NO TRACE', and a QR code.



**Charging Stations.** The Airport expanded dual Level 2 PowerPost EVSE charging stations in the public parking lot to help support electric/hybrid vehicle charging. This is part of the community wide effort to support the use of electrical vehicles in the Valley. **In 2019, eight dual Level 2 PowerPost EVSE charging stations are available for public use.**

**Taxi2Fly and TaxiPool.** In 2018 Taxi2Fly was implemented and the Board instituted a TaxiPool program. Under Taxi2Fly, travelers can select the taxi provider of their choice and arrange for transportation from the Town parking garage to the Airport for \$20 each way. To facilitate this program, the Board entered into a Lease with the Town, effective September 1, 2018, under which the Board leased 141 parking spaces on Levels 3 and 4 of the Town garage from November 15 through the following April 15, and 71 parking spaces on Level 4 of the garage from April 16 through November 14. These spaces were for the exclusive use of Airport passengers.

TaxiPool is a ridesharing program under which passengers who agree to rideshare in a taxi will receive a \$10 discount on the posted fare for each destination. This helps reduce the number of vehicles on local roadways and congestion at the Airport and is aligned with the community Integrated Transportation Plan. It also includes reduced demand for parking at the Airport; greater efficiency and reduced carbon emissions through utilization of high occupancy vehicles; reduced noise along the Highway 89 corridor within the Park and alongside the National Elk Refuge; and reduced risk of vehicle and wildlife collisions.



## Energy And Power

**Energy and Power.** In 2011, JAC received LEED Silver Certification from the U.S. Green Building Council for the Terminal Building Expansion. Additional measures since then have reduced the Airport's energy consumption by 117,900 kilowatt hours per year. In 2018 and 2019, the Airport has made significant environmental improvements by working under the Dark Skies Initiative with Energy Conservation Works and Lower Valley Energy to convert the taxiway lighting and landside lights to LED. Power supplied to all airport owned and operated facilities is now 100% Green Power.

**Membership in US EPA Green Power Partnership Program.** In 2019, the Airport became an official partner of the US EPA Green Power Partner Program. This program is a voluntary program that encourages organizations to use green power to reduce their environmental impact. The partnership currently has more than 1,700 partner organizations voluntarily using billions of kilowatt hours of green power annually. JAC procures 100% of their annual electric use through green power sources.

## Water

**Completion of Stormwater Detention and Filtration System.** The largest success for 2018/2019 for JAC related to water was the completion of a stormwater detention and filtration system. In partnership with the Teton Conservation District, the Board approved a \$2.5 million investment in protecting water quality and continuing their legacy of environmental stewardship. Stormwater runoff from all landside impervious surfaces as well as all airside ramps will filter through the new system, removing oil, sediments and other materials before being released into the soil and eventually groundwater. This results in substantial protection to the local Class I aquifer. The new system will allow for a significant decrease in total suspended solids (80% minimum) and a decrease in total petroleum hydrocarbons (upwards of 90%) as a biologically active "filter cake layer" builds up in the system over time. Additionally, the system is even capable of capturing and filtering a 100-year storm event. It was completed in September 2019 and rolled out through a ribbon cutting ceremony with the Wyoming Governor, the Assistant Secretary for Fish, Wildlife and Parks of the Department of the Interior, and the Acting Superintendent of Grand Teton National Park.



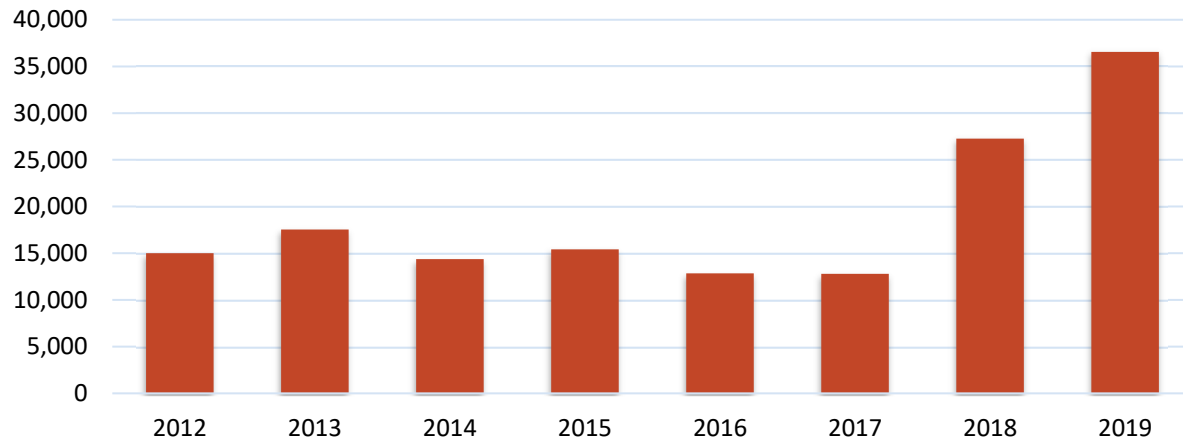
**Glycol Recovery.** JAC has an aircraft de-icing pad at the north end and just to the east of Taxiway Alpha. The de-ice pad parking spots have been reconfigured and are large enough to handle two Boeing 757s or three 737s simultaneously. There are two spent glycol collection drains on the east and south sides of the pad which funnel the used glycol into a 30,000-gallon underground collection tank, which is just south of the concrete pad. There is also an underground valve that can be closed to divert rainwater and other precipitation away from the collection tank during times (or seasons) when de-icing of aircraft is no longer necessary.

Before the spent glycol is collected, it flows thru two oil-water separators which are 1,000 gallons, and 3,000 gallons respectively. The tank monitoring system is powered by four large solar panels, which supply power to a battery bank that sits next to the tank volume display panel.

It has been estimated that as much as 50% of glycol applied to aircraft adheres to the aircraft when it exits the pad and into takeoff position. Although the concentration of glycol in the fluid collected at the pad is lower than historical levels, the amount of glycol collected is significantly higher than in the past which can be due to many factors including airline deicing practices. The recovery data after construction of the deicing pad is included in the following graphic. The Board's goal is to collect as much glycol as possible. This means that snow melt and other water is collected as well. When snow and other water is collected (depending on weather conditions), this leads to lower concentrations, but maximizes the glycol removed from the environment, which benefits overall water quality.



### Deicing Gallons Recovered (2012-2019)



**Water Quality Monitoring.** The Snake River is identified as a Class 1 watershed. The water from the aquifer is suitable for domestic use without treatment. The United States Geological Survey (USGS) has been doing JAC water quality monitoring for 10 years at 19 wells located north of the Airport, and to the south and southwest of the Airport. In 2019, the Board updated their contract with USGS to do annual water quality modeling near the Airport. The cost of this monitoring to the Board was approximately \$358,218 for a 5-year term. Results from the historic studies include:

- **Generally, water in the Snake River Alluvial Aquifer down gradient from the Airport was determined to be of good quality with no constituents exceeding USEPA maximum contaminant levels or advisories.**
- **Previous studies did not detect petroleum products or glycols above laboratory reporting levels.**
- **However, results of water quality monitoring indicated low dissolved oxygen and corresponding high iron and manganese concentrations, as well as low concentrations of triazoles, which can be indicative of small amounts of deicing seeping into the groundwater system.**

The Board will continue to work with USGS and other agencies and partners to better understand the conditions within the aquifer. Future analysis and study will continue to develop methodology to detect the presence of deice fluids or their constituents and monitor the changes in these levels, as well as levels of dissolved oxygen, to evaluate the effectiveness of the glycol capture system and new stormwater system. Ideal outcomes would be an increase in oxygen levels and the reduction or elimination of triazoles, which can be related to deicing chemicals. **The completion of the Stormwater Detention and Filtration System described above is expected to have a positive impact on long term water quality.**



**Wetlands mitigation work in GTNP.** As part of the landside improvements project, the Enterprise Ditch, used seasonally for off airport irrigation was put into a culvert, impacting approximately 0.3 acres of wetland. The Board worked with the Park to mitigate these impacts on an offsite location within the Park (Christian Creek). The restoration and revegetation work done at Christian Creek was completed in October 2019 and will be monitored over the coming years to ensure success of the project.

**Wastewater Treatment.** Prior to 2016 when the Airport connected to the Town of Jackson's wastewater collection and disposal system, the Airport treated and disposed of domestic and industrial wastewater through a series of septic tank and leachfield systems on the Airport. These on-site wastewater treatment and disposal systems were permitted and regulated by the State of Wyoming through the Underground Injection Control (UIC) Program. In 2018 and 2019, the Airport completed a comprehensive investigation of these abandoned wastewater disposal systems to verify that there was no long-term impact to soil and groundwater resources. The Airport coordinated with the State of Wyoming and accomplished soil and groundwater sampling at each site. The Airport's investigation confirmed that no soil or groundwater impacts had occurred at the abandoned wastewater treatment and disposal sites. Based on the Airport's investigation, the State of Wyoming closed the UIC permits associated with the abandoned wastewater treatment and disposal systems and no further investigation or remediation actions were required.

**Update of Spill Prevention, Control and Countermeasures document (SPCC).** The new fuel and glycol facility replaced old underground fuel storage tanks at the Airport with new above-ground storage tanks. The volume of fuel stored in the above-ground storage tanks triggered compliance with 40 Code of Federal Regulation (CFR) Part 112 Oil Pollution Prevention, specifically the Airport is required to develop and implement a Spill Prevention, Control, and Countermeasures (SPCC) Plan. The 2019 SPCC Plan is a detailed document that addresses how the Airport will prevent oil/fuel discharges to water bodies. The SPCC Plan details storage, inspection, containment, transfer, spill response, training, and recordkeeping procedures for the Airport using a deliberate planning process.

**All of the water initiatives greatly enhance the protection of the watershed and build upon the Board's dedication to creating a positive change on their environment.**



## Wildlife Management

The aircraft operational areas are surrounded by a wildlife fence, which has served to minimize conflicts between aircraft and most wildlife. One exception to this is birds, which cannot be restrained by the wildlife fence.

The Airport has a Wildlife Hazard Mitigation Plan (WHMP) that was developed in coordination with the Park which sets forth strategies to (a) increase separation between aircraft and sage grouse through restoration of brood rearing habitat in disturbed areas of the Park to draw sage grouse hens farther from aircraft movement areas and eventually outside of the airport boundary; (b) restore two historic lek sites and develop a satellite lek near the restored brood-rearing habitat to attract male sage grouse; and (c) modify airport conditions to make areas within Airport boundaries less attractive to sage grouse. Implementation of the WHMP alternatives and Greater Sage-Grouse Habitat Restoration Plan should enable the Board to minimize the risks of wildlife strikes within this environmentally sensitive ecosystem.

In May of 2018 the Park submitted a grant request that the Airport and National Park Service co-developed to start the implementation of this plan. The grant was from the Upper Snake River Basin Local Working Group. After presenting these materials, the National Park Service was awarded \$20,000 for that project and the remainder of the project funds will be from the Airport. The Park has been processing the sites to ensure they are weed and exotic plant free and reestablishing the native vegetation to better support birds moving into those areas. Additionally, the State Executive Order on 'Greater Sage Grouse Core Area Protection' has changed and the Airport, as part of the local sage grouse working group, is evaluating the changes and how it might affect these plans.



## Visibility and Screening

The Airport has planted trees and other native vegetation to reduce the visual impacts of airport buildings. The Airport will continue to plant additional trees and replace existing trees to improve the overall visual screening of airport facilities and buildings year-round. Additionally, the Airport works with the Dark Skies Initiative to reduce light pollution and protect the scenic night sky in the Park and Jackson Hole. In 2017, the public parking lot had the light poles lowered and LED lights installed. This further reduced the visual impact and reduced energy consumption. New in 2018 and 2019, the Airport worked with contractors to continue these principles of low light and screening to the new parking areas and changes to traffic flow in the terminal area.



# Community & Employee Programs



People are an integral part of any comprehensive sustainability program. “People Helping People” is the mission of the Airport. The Board and its employees seek to embrace this mantra in every aspect of airport operations. Whether we are helping guests, co-workers or partners, we seek to operate as a team at the Airport. The Board therefore seeks to integrate the Jackson Hole community in its sustainability programs, initiatives, and environmental strategies. The Board strives to support our partners, its staff, and its broader community initiatives through the various programs highlighted below.



## Certifications and Awards

Certifications are one way to allow for progress and to take steps toward building a cycle of continuous improvement. Recognition and certifications help verify the path that the Airport is taking and how it stands in the community and the industry. JAC received the following certifications or awards in 2019.

**Fodor’s named JAC as the Best Tiny Airport in the World:** “Jackson Hole Airport may be small—boasting a grand total of nine gates—but the impression it makes is mighty,” (Fodor’s editorial team).

**BEST Assessment and Certification (97%) through the River Wind Foundation:** This certification is described by the Riverwind Foundation: “The Jackson Hole Airport became the latest organization in Jackson Hole to reach the Business Emerald Sustainability Tier (BEST) level of sustainability performance. The standards in the BEST program are comparable to the world’s most rigorous and comprehensive environmental, community, and economic sustainability criteria. The Jackson Hole Airport joins a growing group of businesses and organizations including the Elk Refuge Inn, Flat Creek Ranch, Jackson Lake Lodge, and Jackson Hole Chamber



of Commerce to achieve third-party sustainability certification by the Riverwind Foundation, the originator of the BEST program.”<sup>1</sup>

**Jackson Hole Chamber of Commerce recognized JAC as the Large Business of the Year: This award was given due to the Airport’s growth, while reducing impacts, and supporting its employees and the community. The Jackson Hole Chamber stated, “The Jackson Hole Airport has been part of the foundation of Jackson Hole for over 50 years. They have grown their programming and service while reducing impacts and being fully integrated with the community’s efforts and goals. They take care of their employees with excellent benefits and providing a great place to work. The Jackson Hole Airport and the Airport Board has taken great steps to be an environmental leader in our community. Commitments to 100% Green Energy, lower emissions vehicles, hydrating refilling stations, and recycling and composting are only some of the steps the Airport has taken to be a leader in sustainability.”<sup>2</sup>**

**JAC was awarded Honorable Mention - Balchen Post Award by AAAE at the 2019 Annual Snow Symposium and Kody Jeppson, JAC Operations Officer, was named Snowplow Operator of the year by the AAAE at the 2019 Snow Symposium: for snow removal efforts.** The award was given for emphasis on safety, management and creation of training for snowplow operators, leadership attributes, extensive technical knowledge and an ability to operate any type of snow removal equipment at JAC.



## Collaborations

Collaboration within the community and broader agencies is a cornerstone of how JAC operates. JAC strives to be a good neighbor, and in 2019 the following events, outreach programs and actions were taken to increase collaboration at the Airport.

**Creation of a ‘Sustainability Focus Group’ for Airport Stakeholders.** As part of the broader focus on sustainability, the Airport created a sustainability focus group with Airport stakeholders to create a core group of individuals dedicated to implementing sustainable measures at the Airport.

**Community Events.** The Airport provided sponsorship, leadership or assistance for the following community events in 2018 and 2019.

- **2018 and 2019 Eco Fair sponsor and attendee**
- **Ribbon cutting ceremony for Stormwater Filtration System/Green Fuels Day**
- **50 Year celebration and presentation by Captain Sully Sullenberger**
- **Touch a Truck Event with Jackson Hole Children’s Museum, Title Sponsor**
- **Participation in 4th of July Parade and other holiday parades**

<sup>1</sup>Riverwind Foundation Press Release, <https://228k3g4ee2bb2v3oe82te2b2-wpengine.netdna-ssl.com/wp-content/uploads/2019/07/JAC-BEST-Certification-Press-Release.FINAL-004.pdf>

<sup>2</sup> Jackson Hole Chamber of Commerce, <https://www.jacksonholechamber.com/events-calendar/annual-awards/>



- Host of Chamber Mixer Event
- Rotary Club High School Scholarships
- JHHS/Workforce Services Job Fair
- Flights and Feathers Program – partnership with Teton Raptor Center
- Pet Partners Program – therapy dog teams
- Host program
- High School Ambassador program
- JH Chamber Winter program
- Womomentum Women in Leadership Conference
- Leadership Jackson Hole Program – two staff members currently enrolled and participating (and two graduates from 2018)
- Free “Behind the Scenes” tours to school groups
- Expansive Terminal Art Program



**Community Outreach Program.** In addition to the specific events listed above, the Airport’s community outreach program highlights key groups that are supporting the overall mission of the Airport by participating in community programs. Programs which the Airport and community partnered in/with during 2018-2019 include:

- Teton Conservation District (TCD)
- Yellowstone -Teton Clean Cities
- Riverwind Foundation: Jackson Hole & Yellowstone Sustainable Destination Program
- Habitat for Humanity–ReStore
- Jackson Hole Children’s Museum
- Jackson Cupboard
- Jackson Hole Food Rescue: Reduce Food Waste (by donating all nonperishable food items collected at the checkpoint)
- Teton County Integrated Solid Waste and Recycling: “RRR” (Reduce, Reuse, Recycle) Business Leader
- Business Leader Program “Zero Waste Construction” Committee Member
- Energy Conservation Works: Partner for Energy Efficiency
- Lions Club International: eyeglass recycling
- Browse and Buy: thrift store donations
- Jackson Hole Chamber of Commerce



## Employee Benefit Program

**Employee Housing Program.** Located in a competitive and expensive housing market, the Airport provides a housing and transportation stipend to full-time staff. This may allow some employees to live near Jackson while it assists others with their transportation expenses. This was updated in 2019 to account for changes in housing prices.

**Employee Training and Certification Program:** The Airport supports continuing education and in 2019, numerous airport employees became Certified Members (CM) of the AAAE. This certification indicates a comprehensive knowledge of airport management issues. The CMs include Anna Valsing; Beata Simms; Jamey Miles; Kaitlin Perkins; Kody Jeppson; Martha Preston; Natasha Stevens; Paul Walters; Phillip Adams; Steve Jeppson.

**Holiday Food Drive.** Annually, the Airport holds a Holiday Food Drive. Non-perishable items are donated at the Airport in exchange for a free drink from Jedediah's. At the end of the drive, all items are donated to the Jackson Cupboard, which distributes these goods to residents in need.

**Airport Host Program.** The Airport has implemented an Airport Host Program for a few years. The hosts greet arriving and departing guests, assisting with travel needs and questions about the facility and local area. The hosts are essential to our guest experience and we continuously strive to go above the expectations of airport users. The Jackson Hole Chamber assists the Host Program in partnership with the Airport during the winter months. The Chamber staff provide guests with local knowledge, hand out reusable shopping bags and serve beverages in the baggage claim area for arriving guests.

**Employee Storm Support.** During adverse weather events, the Airport provides staff with hotel rooms. This initiative supports a sustainable work force while allowing the Airport to provide a high level of service during storm events.

**Employee Volunteer Program.** In support of our motto, "People Helping People," the Board encourages employees to participate in volunteer activities by providing the benefit of paid Volunteer Time Off (VTO). Employees may use VTO to contribute their time and talents to recognized charities, causes and not-for-profit organizations in the surrounding community. Employees may take up to 16 hours of VTO per calendar year to participate in their chosen volunteer program.





# Resilient Resource



JAC provides access to some of the most iconic landscapes in the world, as well as a remarkable town, Jackson Hole Mountain Resort, the National Elk Refuge, and the National Parks among many other extraordinary venues. We continue to strive to serve the community as the mass transportation of the skies. Resiliency is the capacity to adapt and recover from changing conditions. In addition to our initiatives supporting our environment and our community, economic responsibility is an important part of this, and one that we embrace through providing exceptional service to JAC users while protecting the environment that draws the visitors in the first place. JAC prides itself on the fact that the Airport is self-sustaining, with no use of local tax dollars. Below are some ways we are a resilient resource to the community and the aviation industry.



## Operations

The Jackson Hole Airport serves the Town of Jackson and Teton County, Wyoming, and is a gateway to Grand Teton National Park, Yellowstone National Park, and other nearby natural areas such as the National Elk Refuge. The Airport is part of the National Plan of Integrated Airports Systems and is classified by FAA as a non-hub primary commercial service airport. The operational health of the Airport allows it to serve the community in a resilient and efficient way.

**The following is a description of the major areas of operations at the Airport during the 2018-2019 reporting period:**

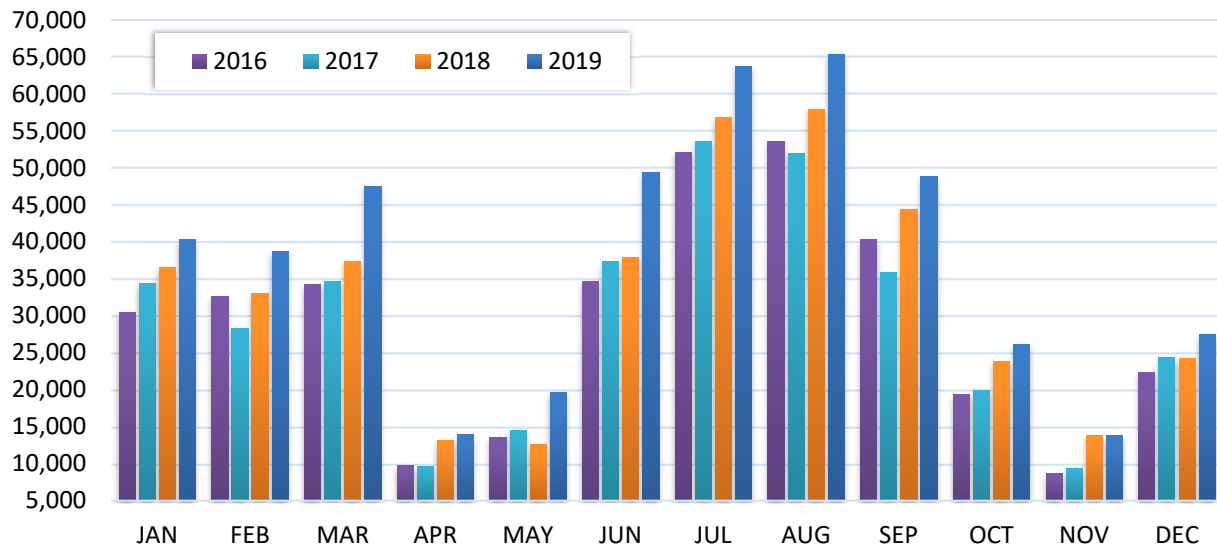
**Air Carrier Operations.** Commercial airlines operating regularly scheduled service at the Airport, either year-round or seasonally, change from time to time. For 2018-2019, the airlines serving the Airport were American, Delta, and United Airlines with Frontier Airlines providing summer seasonal service to Denver (see chart below). A total 391,353 passengers were enplaned in 2018 with 454,629 in 2019. This 2019 number represents an 16% increase over 2018. In terms of enplanements, the Airport is the busiest in Wyoming.



## Airlines and Destinations

AIRLINE	DESTINATIONS
American Airlines	Chicago, Dallas, Los Angeles, Atlanta, New York, Phoenix
Delta Airlines	Salt Lake City, Atlanta, Minneapolis, Los Angeles, New York, Seattle
United Airlines	Denver, Los Angeles, Chicago, Newark, Houston, San Francisco
Frontier	Denver (summer service only)

## JAC Enplanements



**General Aviation Operations.** A fixed-base operator is also located on the Airport. Jackson Hole Aviation, LLC provides fueling and ground service to general aviation (private and corporate) and commercial airlines. It also operates hangars, located south of the Terminal, providing storage for aircraft. In 2018 there were 17,924 general aviation operations, with “operations” being defined as either a landing or take-off at the Airport. In 2019 there were 18,128 operations.

**Ground Transportation Activity.** The Airport is located nine miles from the Town of Jackson and twenty-one miles from Teton Village. Public ground transportation is therefore important to meet the needs of the traveling public. The Board enters into annual contracts with providers of ground transportation services at the Airport. In 2018 and 2019, the Board entered into contracts with 31 and 40 Taxi Providers, respectively.



In June of 2017, the Board entered into contracts with two transportation network companies (TNC). Under these contracts the independent drivers of Uber and Lyft may operate at the Airport. Airport access fees are charged using a “geo fence” which electronically detects when any in-service Uber or Lyft vehicle enters the Airport. These operations have increased substantially from 13,272 in 2018 to 26,375 in 2019. It is expected for this trend to continue.

**Rental Car Activity.** The Board periodically solicits competitive proposals for a limited number of rental car companies that will be permitted to maintain a base of operations on the Airport (“on-airport rental cars”). As of May 1, 2018, the Airport is currently served by three on-airport rental car companies which offer the Enterprise, National/Alamo and Hertz brands from counters in the terminal building. The Airport is also served by several off-airport rental car companies which offer shuttle service from the Airport to their locations in the Town of Jackson.

JAC has a Customer Facility Charge (a “CFC”). CFCs collected by rental car companies are held by the Board to be used for the costs of on-airport improvements designed for the parking, washing, and fueling and/or limited service of rental cars provided to customers by on-airport rental car companies.

To date the CFCs have been used to study alternatives for improving on-airport rental car parking, and then to fund construction of a “quick turn-around” (QTA) facility for use by all on-airport rental car companies. The QTA facility became operational in the winter of 2018-19 and replaced the separate facilities which the on-airport rental car companies had been using for over 25-years, and which had come to the end of their useful lives. All CFCs are now pledged to repayment of the loan used for the construction of the QTA facility. Coordination with on-airport rental car companies will be conducted in 2020 to partner on sustainability measures, including waste reduction.

**Terminal Businesses.** Several businesses are located or supported in the terminal building. Jedediah’s operates a restaurant and gift shop in the secure passenger holding room and a snack bar in the non-secure lobby of the terminal building. The contract with Jedediah’s was renewed in 2019 and included sustainability language regarding the support of the Airport’s waste diversion policies. Jedediah’s worked with the Airport to implement a composting pilot program. Waste diversion is included in the contract. The NPS, through the Grand Teton National History Association, operates a natural history gift shop inside the passenger holding area. The Board also has contracts with three companies to provide vending services in the terminal.

**Inter-Agency Helibase Operations.** Pursuant to a Second Amendment to the 1983 Agreement, Bridger-Teton National Forest and the Grand Teton National Park have established an interagency helibase at the Airport. The joint base consists of a 3,200 square foot building, two 30' by 30' helicopter landing pads and one 40' by 40' pad. There is also spill containment parking for fuel trucks and a mobile communications trailer.



The building houses offices, a crew ready room, a physical fitness room, a training/meeting room, a storage area stocked with gear and equipment for response crews, and an operations center. In 2018 and 2019, the crew based at the helibase responded to numerous wildland fires and conducted many short-haul search and rescue (SAR) operations in the Park and National Forest. The helibase directly serves 2.5 million acres of federal land and is available to assist in rescue and fire operations on 18 million acres across the Greater Yellowstone Ecosystem. In 2019 they started construction of two additional helicopter landing pads north of the existing location.



## Airport Planning

---

Planning is vital to having a facility which efficiently meets both current and future needs. Effective planning allows the Airport to adjust to changing conditions, meet tenant and user needs, reduce impacts and create a cycle of improvement. Since the Master Plan Update of 2011 (20-year planning document), several supplemental plans have been completed. The first three plans denote previously completed planning materials that help guide the airport improvements. The plans in boldface type below are new completions in 2019 and will assist with planning going forward.

A landside parking and traffic study was completed in 2012, the results of which will be included in the future Master Plan and were implemented in 2018/2019.

**An Updated Airport Layout Plan (ALP) was submitted to FAA in 2019 and approved by the FAA November 2019.**

A Conceptual Area Development Plan in 2015 identified a preferred development strategy to most efficiently utilize the space available on the Airport for future commercial aircraft operations, general aviation operations, Airport Rescue and Firefighting and Snow Removal operations, Rental Car Service Facilities and other facilities such as parking for airport users and rental cars.

**A Sustainability Management Plan (SMP) was completed in 2019, which is helping guide the Airport in their sustainability goals and implementation, creating a cycle of continuous improvement.**

**The Sustainability Accomplishments Report was created and updated in 2019. In addition to the management plan, the Airport rolled out its sustainability accomplishments report which details those items completed under the sustainability management plan. This will help track sustainability progress over time.**

*These plans created the foundation for the 2018-2019 airport improvements which are summarized below.*



## Facility Improvements

**Airport Parking Improvements.** After careful planning, the Airport was able to make a number of parking lot and general landside improvements. Those included removing car parking from the far east of the development area, fencing in the parking areas for better control, improving the customer experience and reducing the number of areas that traffic enters the terminal loop road. The Airport also relocated the short-term lot to the south of the terminal which eliminates the need for those customers to walk across the terminal loop road improving safety. The overall configuration changes led to the addition of roughly 150 parking spaces which has helped relieve some of the congestion previously experienced during peak travel seasons. This new configuration was put into place at the end of June 2019. The parking lot changes have improved the flow around the terminal for the 2019 summer and start of the 2019-2020 winter season. Additionally, a new parking system was installed to create better user experience relative to ease of payment.

**Terminal Building Improvements.** In 2018 the Airport Board finished a conceptual design for a new/expanded restaurant area. The Airport is very excited about this future project as outlined in that conceptual design, but also wanted to make some interim improvements that allow for better flow and customer experience in the existing restaurant space. Therefore, a study and design were completed to make these interim improvements which really focused on the following items:

- Clearly defining the retail space and reducing the number of entry points into that space.
- The creation of a more defined grab and go area.
- Defined queuing space for those wanting to order food from the kitchen.
- Improved acoustics.

Once this interim design was completed, the work was contracted and completed in the Spring of 2019. Since being finished, the restaurant shared that their grab and go throughput has increased significantly. General user feedback has been that the experience while using the restaurant has also improved.

Additional notable changes to the terminal include the addition of a mother's room and a pet relief area. These changes collectively increase overall user experience at the Airport while supporting and addressing the changing needs of passengers.

**Radon mitigation project (Terminal basement).** In 2019, the Airport completed testing in the basement areas of the terminal and found elevated levels of radon. The levels were slightly above advisory EPA levels for mitigation so JAC contracted with a radon mitigation specialist to install a mitigation system. Radon levels have been reduced below the advisory levels, providing a positive benefit to the working environment in those areas.



**New Fuel and Glycol Storage Facility.** In 2018, the Airport built a fuel and glycol facility with environmental stewardship at the forefront of the design process. Water quality will be protected in the unlikely event of a leak of a petroleum product, using multiple layers of containment, numerous oil/water separators and an extensive storm water filtration system that resolves any issues before the (contaminants) could leave the property. **While unlikely, if glycol is released at the storage facility, the state-of-the-art, real-time monitoring system will automatically detect glycol in the stormwater and immediately divert the contaminated water into a collection tank rather than releasing it to the environment.** The focus on this facility was to protect water quality and provide efficiency for the operators.

Specifically, older underground fuel tanks were replaced with new above-ground tanks, which are surrounded by a concrete basin sufficient to contain any bulk tank spills. Spill detection technology has been deployed throughout the Fuel Farm. Run-off is monitored for hydrocarbons and glycol before discharge to the Airport's storm water filtration system, and real-time video monitors all Fuel Farm operations. The entire facility has also been screened to decrease its visual impact. This facility provides the following capacity: 150,000 gallons of Jet A, 12,000 Gallons of AVGas, 30,000 gallons of Unleaded, 12,000 of Diesel, 30,000 gallons of Type I Glycol and 6,000 gallons of Type IV Glycol.

Construction of the new fuel facility was financed with revenues which are being repaid through the collection of a customer facility fee (CFF) initially set at 5¢ per gallon and a fuel facility fee (FFF) initially set at 20¢ per gallon. These are in addition to the fuel flowage fees which are paid as rent by the FBO and remain effective.

**New QTA Facility.** As noted above, in 2018 the Airport constructed a new and improved "quick turn-around" (QTA) facility for use by all on-airport rental car operators. The QTA facility became operational in the fall of 2018 and replaced the separate facilities the on-airport rental car operators had been using for over 25 years, which had come to the end of their useful lives.

The QTA has several environmental benefits. The QTA is equipped with a wash water recovery, treatment, and reuse system which is anticipated to result in a 75% - 90% reduction in wash water used by the on-airport rental car companies. It is equipped with LED lighting and high efficiency natural gas boilers to reduce fuel consumption and emissions. It has in-floor heat, insulated precast wall panels, and high-speed roll-up doors to reduce heat loss during winter operations. Car wash effluent is routed to the Town of Jackson wastewater treatment plant which replaces on-site septic/leach field treatment. The two underground fuel tanks associated with the old buildings were replaced by connection to Airport's above-ground, state-of-the-art fuel facility. It also provides additional opportunities for waste diversion due to the layout of the QTA, allowing for behavioral and physical changes that will support waste diversion goals. This will be an area of focus in 2020.



**General Aviation Facility Improvements.** Jackson Hole Aviation, LLC ("JHA-LLC") is currently the fixed base operator ("FBO") at the Airport. JHA-LLC operates at the Airport under two types of agreements, (a) a Master Operating Agreement ("MOA") granting it the right to operate an FBO on the Airport, and (b) a lease of Board-owned hangars and related facilities. JHA-LLC is authorized to operate an FBO at the airport under its existing MOA through April 26, 2023, with no rights to renew.

In 2017, the Board signed an Asset Purchase Agreement with JHA-LLC. Upon closing of the Agreement, the Board would itself operate all FBO facilities on the Airport. The Board found that due to the Airport's location within a National Park, the area available for general aviation is limited. Having more than one FBO operating at the Airport would result in duplication of facilities. These and other factors led to the Board's decision to enter into the Agreement.

Because of a lawsuit challenging this transaction, the Board and JHA-LLC entered into an amendment to extend closing of the Agreement until the lawsuit was successfully resolved. In 2019, the Wyoming Supreme Court affirmed the District Court of Teton County and held that the Board may use revenue bonds to purchase the assets of JHA-LLC. The Board is continuing to renegotiate the purchase price with JHA-LLC under the Asset Purchase Agreement.

**Runway Improvements.** The Airport has a single 6,300-foot runway (at an elevation of 6,450 feet), which was built in the 1960s to accommodate the Douglas DC-3 aircraft then serving the Airport. The runway is 150 feet wide, and is asphalt overlaid with a porous friction course surface. Due to the age and the condition of the pavement, in 2019, the Airport started planning for a runway rehabilitation/reconstruction project which will be initiated in 2021.



## **Security And Screening Updates**

Security and screening are important elements of the experience at any airport. For JAC, keeping security as a function performed by the Board allows the Airport to more readily adjust to changing needs as operations fluctuate.

**Operation of Passenger Screening.** The Jackson Hole Airport is one of several airports in the country which have "opted out" of security screening performed by the Transportation Security Administration ("TSA"). Security screening for opt-out airports is performed by screening contractors under TSA standards and funding. Due in part to its unique history and organizational structure, the Board is currently the only airport operator in the United States which itself has been awarded a screening contract by TSA. This program supports the community through employment of up to 58 screeners and allows the Airport to improve communication and enhance the customers' experience.



The Board operated passenger and baggage security screening at the Airport during 2018 and 2019 under a fixed-price contract with TSA. Pursuant to this contract, the Board has recruited, trained and maintains a workforce of approximately 58 security officers and support staff at the Airport. These officers operate both the passenger screening checkpoint and checked baggage screening, all in accordance with TSA standards and operating procedures. In 2019, the Board screened more than 454,629 passengers and their checked baggage.

**Law Enforcement Contract.** Because it is served by scheduled air carriers, and security screening of passengers and baggage is performed, the Board is required by federal law to ensure a law enforcement presence at the Airport. In light of the volume of enplaned passengers, and the Airport's distance from the Town of Jackson, law enforcement personnel are required to be physically present at the Airport during all hours in which passenger or baggage screening is conducted.

To meet this requirement, the Board entered into a Memorandum of Understanding ("MOU") with the Town of Jackson under which law enforcement officers from the Jackson Police Department are stationed at the Airport. Under the current MOU, the Board reimburses the Town \$44,250 per month to provide these law enforcement services for 2019.



## Financial Management And Planning

Successful financial planning and management is another important element of making the Airport a resource for the community. Below is a summary of the finance and capital improvement plan which is a mark of the overall financial health of the Airport.

**Overview of Airport Finance Requirements.** In terms of operating revenues, the Board is a financially self-sustaining entity. In 2018 and 2019, it received no operating revenue from Teton County, the Town of Jackson or the State of Wyoming. All operating expenses are matched by operating revenues, which are generated by rentals and fees imposed on airport users. These include airport tenants such as airlines, rental car operators, the fixed base operator and ground transportation providers. The Board also receives landing fees, fuel flowage fees and user fees from others who conduct business on the Airport.

Each year the Board establishes an operating budget based on expected revenues. Cash reserves are retained for those years in which revenues do not match anticipated expenses including capital project expenses. Cash reserves are also used to fund the Board's "match" for capital projects which is required for all federal and state grants. For each of the past ten years, the Board has come within two percent of hitting its annual expense targets.



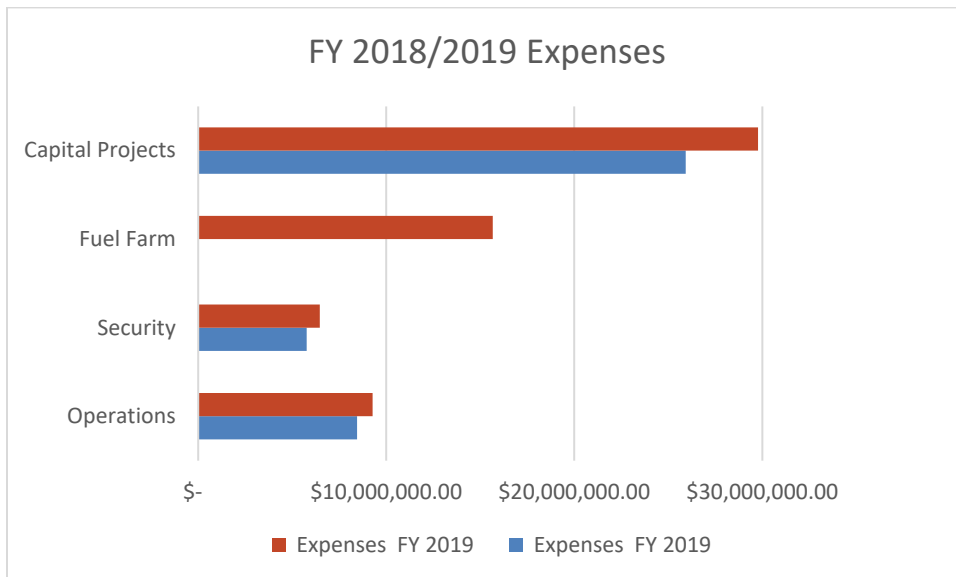
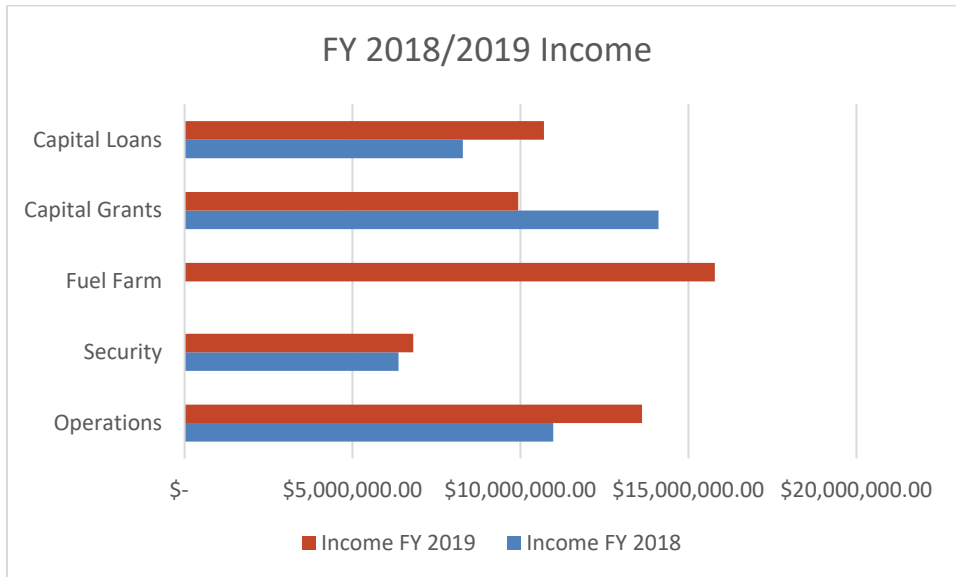
The Board receives annual grants from the FAA, along with occasional grants from the Wyoming Aeronautics Commission and Wyoming Business Council, for capital improvements at the Airport. To protect the FAA's investment, federal law provides that revenue generated by the Airport will be expended for the costs of the Airport, the local airport system, or other local facilities owned or operated by the airport owner or operator and directly and substantially related to the air transportation of passengers or property. This is generally described as a "revenue diversion" prohibition. As a result of this federal requirement, all airport revenue must remain on-airport or be used for expenses which are directly and substantially related to air transportation.

The Airport Board operates under other financial constraints. The 1983 Agreement requires that all rates and prices charged to the public by the Board and its subcontractors and licensees shall be fair and reasonable. As the recipient of FAA grants, the Board is also subject to an FAA requirement that it establish a fee structure which will make the Airport as self-sustaining as possible under the circumstances. In most cases, this requires the Board to charge market rentals and fees to airport tenants and users.

**Summary of Finances.** Operating revenues and expenses are those incurred with respect to ordinary airport operations. The Board's operating revenues and expenses from year to year will therefore depend to a significant degree on the Airport's aircraft and passenger volume. For instance, fees received from many tenants are on a "percentage of gross" basis; parking revenues are directly related to parking lot usage; landing fees and fuel flowage fees are directly related to aircraft activity. Operating expenses do not immediately and automatically mirror aircraft and passenger volume and must therefore be closely monitored and changed by the Board when appropriate.

A capital outlay is an expense for the purpose of constructing or extending the life of a fixed asset, such as the runway or a building. Capital outlays at the Airport are funded in large part through grant revenues and Passenger Facility Charge ("PFC") project reimbursements. Grant revenues are dependent on both the appropriation of federal funds, and the Airport's passenger volume upon which the level of grant funding is partially based. A PFC on the other hand is a congressionally authorized charge imposed by airlines for the Board, on each ticketed passenger that utilizes the Airport, up to established caps on each passenger's entire trip. PFC's may be used by the Board for capital outlays approved by FAA. The amount of PFC reimbursements received by the Board is therefore related, but not directly proportionate, to passenger volumes at the Airport. PFC Collections at the Airport are currently pledged through the year 2030 to repay outstanding debt which was taken out for the terminal expansion project.

A summary of the major sources of revenue and expenses are included below, followed by a list of major projects. Note that summary of income and expenses are listed by Fiscal Year. FY 2018 runs from July 2017 to June 2018, and FY 2019 runs from July 2018 to July 2019.





**Capital Improvement Plan.** Eligibility for FAA and/or WYDOT grant funding requires the Board maintain a Capital Improvement Plan ("CIP"), which projects the estimated uses of federal grant funds over a five-year time horizon. Proposed capital improvements must be reflected on the CIP to be eligible for federal funding. Recently completed or planned projects are included below.

#### Recently Completed or Planned Projects

Terminal Improvements (Restaurant Remodel, Terminal Carpet, Recycle Bins, FID Replacement, & Restaurant Kiosk Relocation)	\$2,250,000
Airfield / Landside Improvements (Drainage improvements, Hangar 1 Improvements, Automated Exit Lane, & Overall Camera Expansion)	\$875,000
Acquire SRE (2 Plow Trucks & 1 Broom)	\$1,160,000
Acquire Airport Operation Vehicle / SRE	\$115,000
Parking Lot/Access Road Rehabilitation Project	\$6,100,000
Seal Coat and Mark Pavements To Be Funded FY2021	\$290,000
Wildlife Hazard Modifications	\$120,000
Airfield / Landside Improvements (Hangar 4 Ramp, Roof over Recycle Bins, & Electronic Key System)	\$175,000
Acquire SRE (Plow / Sanding Truck)	\$125,000



## Conclusion

---

During 2018 and 2019, the Jackson Hole Board continued its commitment to sustainability of the Airport and to its unique environment. We believe we have a unique responsibility to help steward the resources of the Park and the Greater Yellowstone ecosystem, and help ensure Jackson Hole remains a special place for travelers from around the world to experience its scenery, abundance of its wildlife, and diversity of its recreational opportunities. Additionally, in 2019 the Board focused additional effort on the broader concerns of climate change and how to reduce the Airport's carbon footprint. This report highlights some of these accomplishments and demonstrates the Board's commitment to the environment, leadership in reducing the drivers of climate change, and holding to a high degree customer service and safety. To this end the Board has worked collaboratively with the NPS and conservation groups to consistently seek, set, and achieve high standards in all three of these areas.

The Board is proud of the progress and products which have resulted from cooperation with NPS and other stakeholders during 2018-2019. The cooperative relationship between the Board and the NPS is based largely on a mutual philosophy. It is a view that in each challenge we face to bring air service to a pristine part of the country, there are also opportunities: to combine cutting edge technology with common sense conservation and education, and to marry National Park values and traditional old west culture with a sustainable vision of the future.

As we move forward, it is the hope of the Board that this shared philosophy will continue to thrive. Going forward, the Board strives to be a leader in the community regarding sustainability and resiliency both locally and with a vision for a more sustainable world. We work to instill these values in our staff, tenants, and service providers, and to extend it to other airport users in the areas of general aviation and ground transportation.



## APPENDIX A

### Board Organization and FAA Obligations

Federal statutes authorize the Secretary of the Interior to enter into agreements with public agencies, such as the Jackson Hole Airport Board (the "Board"), for the operation of airports in or near national parks. Pursuant to that authority, the Department of the Interior (the "Department") and the Board entered into an Agreement dated April 27, 1983 (the "1983 Agreement"), for the operation of the Jackson Hole Airport (the "Airport") in Grand Teton National Park (the "Park"). The 1983 Agreement was originally for a term of 30 years and granted the Board two 10-year options to renew. The Board exercised these two 10-year options in 1993 and 2003, which extended the 1983 Agreement's term to 2033.

To be eligible for Federal Aviation Administration ("FAA") grants for capital improvements to airport infrastructure, the Board and other airport sponsors must comply with FAA regulations and grant assurances. Among these is a requirement that the Board either own or have leasehold control over the land on which the Airport is located for a term of at least 20 years. To maintain eligibility for FAA grants, in 2004 the Board began seeking an amendment to the 1983 Agreement to provide additional terms with extension options for the periods 2033-2043 and 2043-2053.

After an extensive environmental assessment process, on May 18, 2011 the Department of the Interior, acting through the National Park Service ("NPS"), entered into a Third Amendment to the 1983 Agreement (the "Third Amendment"). Under the Third Amendment, the term of the 1983 Agreement was extended to April 27, 2053, through the addition of two 10-year options. The Board has exercised the first option for an additional term of ten years, from April 28, 2033 through April 27, 2043, thereby giving it the requisite 20-year term required for FAA grant eligibility.

The Third Amendment also expanded the Board's obligations to explore reasonably available environmental mitigation measures. A new paragraph 4(i) of the 1983 Agreement requires the Board to act in good faith and in coordination and cooperation with NPS to develop and implement reasonable and cost-effective mitigation measures as may be available to reduce environmental effects on the Park. Section 12 of the 1983 Agreement, as amended, requires the Board and NPS to discuss and identify mitigation measures which may be available to comply with the requirements of paragraph 4(i). Finally, a new Section 13(h) was added which requires the Board to submit to NPS a report describing the Board's activities and operations during the previous two calendar years, its efforts at reducing negative environmental impacts, and specifically, its efforts to reduce noise impacts on the Park. This is the fifth Biennial Report submitted under this requirement and covers the Board's activities and operations during calendar years 2018-2019.

The Wyoming Joint Powers Act was adopted in 1971 (the "WJPA"). The WJPA provided that previously established airport boards would become joint powers boards, without need to reorganize. As a result, the Board is now both a statutory airport board under the Wyoming Airport Act and a joint powers board under the WJPA. Joint powers boards usually operate under joint powers agreements, and in



October 2013 the Town and County entered into a revised Joint Powers Agreement with respect to the Board.

Since 1967 the Board has had the power, delegated by the Town and County, to acquire lands for airport purposes (by lease or otherwise). The Board exercised this power by entering into the 1983 Agreement in its own name with the Department. Also delegated to the Board was the power to acquire other property and to construct facilities for airport purposes. All facilities of the Airport have therefore been constructed and acquired in the name of the Board. The 2013 Joint Powers Agreement with the Town and County confirmed that the Board owns all airport improvements and facilities.

Under Wyoming Statutes, the Board is both a “body corporate,” and a “local governmental entity” which has separate existence and is distinct from the Town and County. Though it has certain governmental powers, in most instances the Board operates the Airport in its “proprietary capacity,” and more like a private business. It has no power to tax. Its revenue comes only from its operations and grant funding.

**Members of the Board.** The five members of the Board are appointed jointly by the Town and County, each for a five-year term. In February of each year the Board reorganizes and appoints new officers. By tradition, Board members rotate positions, with each member thereby having the opportunity to serve as Member, Secretary, Treasurer, Vice President and President during their five-year term. Board members at the end of this reporting period (2018-2019) were:

	<p><b>Rick Braun.</b> Rick Braun was appointed to the Airport Board in 2016. He is a very experienced aviator with over 45 years of involvement in international and domestic aviation operations, which included 15 years of service with Boeing, where Braun was a pilot and led the Operation Enhancement Study for Boeing at the Jackson Hole Airport.</p>
	<p><b>Mary Gibson Scott.</b> Mary was appointed to the Airport Board in 2016. She retired as a senior manager from the NPS, and has comprehensive experience in planning and development, infrastructure management, and emergency response programs. She is also on the national board of the Student Conservation Association.</p>



	<p><b>John Eastman.</b> John was appointed to the Airport Board in 2013. He is an accomplished business entrepreneur with 20 years' experience creating, building, and leading successful start-up businesses. John has extensive community board experience including the St. John's Hospital Board, the Center for Resolution and Mediation, and the Historic Preservation Board. John was also recently appointed to the <a href="#">National Parks Overflights Advisory Board</a>.</p>
	<p><b>Bob McLaurin.</b> Bob was appointed to the Airport Board in 2019. He served as the Manager for the Town of Jackson for 17 years as well as Assistant Town Administrator and Town planner. Bob has been active in numerous nonprofits including the Teton Literacy Center, Jackson Hole Historical Society, and the Jackson Hole Rotary Club.</p>
	<p><b>Jerry Blann.</b> Jerry has extensive Airport Board experience. He was appointed to the Airport Board in 2000 and is currently serving his third term. Additionally, Jerry has held previous executive positions and Board level appointments. Jerry was the President of the Jackson Hole Mountain Resort for 22 years, where he oversaw more than \$200 million dollars in capital improvements before retiring in 2018</p>

**Airport Staff.** The Airport has a regular staff of 35 personnel which are engaged in administration, airfield operations and maintenance, project management, aviation fuel facility operations, community outreach, hospitality and other ordinary airport functions. It also has a security screening staff which averages 58 personnel. With total employment of over 90 staff, the Airport is one of the larger employers in Teton County. The Airport's senior staff are:

	<p><b>Jim Elwood, Executive Director.</b> Jim came to the Jackson Hole Airport in 2014. Before coming to Jackson, Jim was the director of Aspen/Pitkin County Airport in Aspen, CO. While in Aspen he had significant accomplishments in improving the environmental stewardship of the airport. Prior to working in Aspen, Jim served as the Airport Manager in both Eagle County Airport and Pueblo Airport in Colorado. His many accomplishments in the industry include serving as Chair for the American Association of Airport Executives in 2008, and the Outstanding Leadership Award from Airports Going Green in 2013.</p>
--	--



**Dustin Havel, Assistant Airport Director – Operations.** Dustin Havel came to the Jackson Hole Airport in May of 2016. Prior to working at the Jackson Hole Airport, he was the Assistant Aviation Director – Operations at the Aspen/Pitkin County Airport. Dustin Havel graduated Magna Cum Laude from Central Missouri State University with a Master of Science in Aviation Safety and has over 10 years of experience in Airport Operations and Management. He also has a Bachelor’s degree in Aviation Technology – Maintenance Management and Bachelors in Business Administration – Computer Information Systems. An accredited Airport Executive, Certified Aircraft Rescue & Fire Fighter and Airport Certified Employee in all facets, Dustin has also logged over 250 hours of Instrument Rated Private Pilot flying time.



**Aimee Crook, Assistant Airport Director - Security Operations.** Aimee Crook is a Jackson Hole native who started working at JAC the year she graduated high school. In 2000, Aimee graduated from the University of Wyoming with a Bachelor of Arts in Criminal Justice. Aimee was promoted to the Director of Security Screening in 2002 and played an intricate role in obtaining a Private Security Screening Contract on behalf of the Jackson Hole Airport Board. In 2016 Aimee became the Manager of Security Operations. Aimee is a Certified Member of the American Association of Airport Executives and currently serves as the Assistant Airport Director – Security.



**Michelle Anderson, Assistant Airport Director - Finance and Administration.** Michelle started working at the Jackson Hole Airport as the Office Manager in 2002. While working for the Airport, she earned her Executive MBA from the University of Wyoming. She has also earned her Certified Member designation with the American Association of Airport Executives. During her time at the Airport, Michelle has helped the Airport successfully bid the private screening contract with TSA multiple times. Michelle was promoted to Assistant Airport Director in 2017. Her accomplishments include being awarded Wyoming’s 40 Under 40 Award for 2017, and her recent appointment to the Board of the Wyoming Airport Operators Association.

**Board Obligations to FAA Generally.** In addition to its obligation to NPS under the 1983 Agreement, the Board has obligations to the Federal Aviation Administration (“FAA”). In accepting federal grant funds, the Board is required by law to give 39 different "assurances" to FAA regarding its use of grant funds and operation of the Airport. If the Board breaches these assurances, it will be ineligible for future grants and may be required to repay prior grants. Principal grant assurances include the following:

**Grant Assurance No. 4:** The Board must certify that it has "good title" to airport land. Where the airport sponsor does not own the underlying ground, this term is defined to include a lease of at least 20 years past the date of the grant.



Grant Assurance No. 21: The Board must “take appropriate actions . . . to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft.” This is accomplished to the south and west of the airport by the Teton County Airport Zoning Resolution, which prohibits structures above certain heights surrounding the airport and conditions near the airport which are hazards to aircraft in flight.

Grant Assurance No. 22: The Board must make the airport available "for public use on fair and reasonable terms and without unjust discrimination, to all types, kinds, and classes of aeronautical uses." Under this requirement the Board may not prohibit scenic flights or other particular types of aeronautical operations, must accommodate all airlines which wish to serve the airport, and in most cases must permit all general aviation operations and businesses so long as space is available, and they meet the Board’s Minimum Standards.

Grant Assurance No. 23: The Board may not grant or permit any "exclusive right for the use of the Airport" by persons providing aeronautical services to the public. For instance, it cannot specify that all flight training will be provided by a single private operator at the airport. Though it may not grant an exclusive right, as the operator of the airport the Board may exercise its “proprietary exclusive right” to operate any or all aeronautical activities on the airport using its own employees.

Grant Assurance No. 24: The Board must maintain a rent and fee structure which will make the airport as self-sustaining as possible under the circumstances. This is interpreted to require, in most cases, the charging of market rent on the land side of the airport and a reasonable rental on the airside of the airport.

Grant Assurance No. 24: All revenues generated by the airport must be expended for the capital or operating costs of the airport, or other facilities owned or operated by the Board and directly and substantially related to air transportation. A violation of this grant assurance is often referred to as “revenue diversion.”



## **APPENDIX B**

### **Mitigation Measures from the Final Environmental Impact Statement**

## MITIGATION MEASURES

### Existing Mitigation Measures

The 1983 agreement included a number of provisions and requirements intended to ensure that the airport would remain compatible with the purposes of the park. Measures taken by the Jackson Hole Airport Board and others that contribute to meeting these requirements are identified below. Under the Preferred Alternative (Alternative 2), these requirements and measures already taken to mitigate the effects of the airport would remain in effect through the extended term of the agreement, unless superseded by more stringent requirements. Under Alternative 1, these measures would remain in effect until 2033 unless circumstances made them no longer applicable.

- The agreement includes both single-event and cumulative noise requirements. Specifically, the agreement requires that the 55 DNL contour remain outside of the noise-sensitive areas of the park, and that the 45 DNL contour not extend beyond a specified restriction line.
- No aircraft is permitted to operate at the Jackson Hole Airport if it has a single-event noise level exceeding 92 dBA on approach, as determined by Federal Aviation Administration Circular 36-3B or a specified equivalent certification procedure.
- The Board's noise abatement plan establishes a limit on the number of commercial jet aircraft operations of 6.5 average daily departures of the Boeing 737-200 aircraft. A greater number of departures is allowed only by substituting quieter aircraft based on a noise equivalency factor.
- The Board prohibits the operation of all Stage 2 aircraft under 75,000 pounds. Heavier Stage 2 aircraft are prohibited by federal law.
- The Board has adopted a voluntary curfew on night flights, with a system for notifying owners of aircraft that violate the curfew by letter and requesting them to refrain from further violations. The curfew, which applies to all scheduled passenger service and general aviation aircraft, is between the hours of 11:30 p.m. and 6:00 a.m. for landing and 10:00 p.m. and 6:00 a.m. for takeoff. The Board also includes a curfew provision in its airline contracts that prohibits jet arrivals and departures between 9:30 p.m. and 7:00 a.m. The curfews have been successful and only a few curfew violations occur. Overflights of the park below 3,000 above ground level are also discouraged.
- The Board has made the airport's noise abatement procedures widely available to all pilots and aircraft operators through a variety of means, including an insert for pilot notebooks, the airport

website, air traffic control broadcasts, aeronautical publications, magazines, and other materials typically used by pilots for flight planning. The procedures indicate that Runway 01 (from the south) is the preferred arrival runway and Runway 19 (to the south) is the preferred departure runway, and request that all pilots stay east of the Snake River and/or U.S. Highway 26/89/191. In addition, control tower personnel inform pilots of the noise abatement procedures and encourage their compliance.

- The Board includes language in all leases with scheduled passenger service airlines requiring them to ensure that their pilots are made aware of the noise abatement rules and procedures and to take appropriate action against employees for operations contrary to the noise control plan where there exists no valid reason for noncompliance. Similar language in the airport's contract with the fixed-base operator requires the fixed-base operator to insert language into all subcontracts to ensure noise abatement plan compliance, and requiring them to distribute copies of the noise abatement plan to pilots departing the airport.
- As required by the agreement, the Board inserts in all contracts a prohibition on the origination from the airport of scenic, charter, and training flights over noise sensitive areas of the park.
- An air traffic control tower was constructed in 2000. The tower is at the center of a Class D airspace "cylinder" extending to a radius of 5 miles and 3,000 feet above ground. Within this airspace, all aircraft must be in communication with the tower and operate under the direction of controllers. The presence of the tower facilitates the safe and efficient use of the airspace and reduces overflights of the park below 3,000 feet above ground level.
- The Federal Aviation Administration's Air Traffic Control Beacon Interrogator-6 aircraft tracking system became operational in 2009, and provides air traffic controllers with the ability to track aircraft in the Jackson Hole area. The BI-6 has the potential to more efficiently move aircraft in and out of the airspace and thereby decrease noise impacts on the park.
- The Board established a noise complaint system to record all noise complaints from the public. The Board investigates complaints, and persons filing complaints are given available information regarding the cause of their complaint, any reasons given for the violation, and action taken.
- The Board has adopted a comprehensive noise monitoring program that documents the level of compliance with the terms of the 1983 agreement. In 2003, the Board upgraded its noise monitoring capabilities and installed a permanent system that gathers data continuously. This system has subsequently been integrated to collect data from the BI-6 and correlate it with specific noise events. The system provides the Board with a highly accurate database of how the park is affected by aircraft noise and is/will be useful in identifying additional measures that may be effective in reducing aircraft noise.
- In accordance with the agreement, the Board has ensured that all buildings are compatible in architectural style and appearance with structures that were present in 1983, and that they do not exceed the specified height. The low height of the buildings, muted colors that are compatible with the natural surroundings, and vegetative screening and planting have ensured that the airport is visually subordinate to the landscape character.

With respect to noise, the Board has complied with the terms of the agreement, and with the objectives of the noise abatement plan, which are to ensure that aircraft noise exposure will remain compatible with the purposes of the park and will result in no significant increase in cumulative or single-event noise impacts on noise sensitive areas of the park. In fact, the DNL noise contours have actually decreased in size since the first Federal Aviation Regulations Part 150 study in 1984. The most important reason for this decrease is the introduction of quieter Stage 3 aircraft, and the prohibition of noisier Stage 2 aircraft. Chapter 3 includes a more thorough discussion of this topic.

### **Options for Mitigation Measures to Further Reduce Impacts of the Airport**

As described above, Alternative 2 includes a number of changes to the existing text of the 1983 agreement, the net effect of which is to strengthen the requirements for the Board to undertake efforts to further reduce the adverse effects of the airport on the park. These additional changes are beyond compliance with the existing noise and other requirements of the agreement. Alternative 2 would not alter the existing single-event and cumulative noise requirements of the agreement, but would require the Board, in cooperation with the National Park Service, to identify, develop, and implement additional measures to reduce noise and other environmental impacts to the lowest practicable levels which are reasonable, consistent with the safe and efficient operation of the airport, and with applicable law, regulation, and existing contractual obligations.

One of the primary purposes of the agreement, as stated on its first page, is “...to provide a mechanism to facilitate the qualification for Federal Aviation Administration grants-in-aid...” The agreement also deems that the Board is the operator of the airport and is solely responsible for its operation, management, utilization, and maintenance. It further specifies that airport operations must comply with regulations of the Federal Aviation Administration.

When airport owners or sponsors, such as the Jackson Hole Airport Board, accept funds from Federal Aviation Administration -administered airport financial assistance programs, federal law requires that they agree to certain obligations (assurances). These obligations require the recipients to maintain and operate their facilities safely and efficiently and in accordance with specified conditions. The assurances appear either in the application for federal assistance and become part of the final grant offer, or in restrictive covenants to property deeds. The duration of these obligations depends on the type of recipient, the useful life of the facility being developed, and other conditions stipulated in the assurances.

In the case of the Jackson Hole Airport, a 20-year extension to the authorized term of the agreement is necessary to ensure that the Board complies with Federal Aviation Administration grant assurances regarding a satisfactory interest in the property on which the airport is situated. However, there are numerous other obligations with which the Board must comply. These are equally important in ensuring its eligibility for funding. Actions contrary to any of these obligations would potentially place the Board in non-compliance with Federal Aviation Administration grant assurances and even federal law. Noncompliance would disqualify the Board from receiving grants, and could result in an order requiring the Board to repay grant funds already received. Such measures would be contrary to the purpose and need for the proposed action.

Furthermore, the Board must comply with all applicable laws and regulations, and in this regard specifically with those that pertain to airport noise compatibility planning and noise and access restrictions. These requirements are discussed in more detail below under the heading “Noise and Access Restrictions.”

The Jackson Hole Airport Board and National Park Service have established a working group to address the environmental effects of the airport on the park and to identify and develop mitigation measures to reduce these effects. The group is composed of two members of the Jackson Hole Airport Board, the airport director, the park superintendent, and key staff from the airport and the park. The members of this group already work together closely on a wide variety of matters related to the airport. Nonetheless, the group will continue meeting together several times each year for the specific purpose of addressing environmental effects and mitigation measures.

The Jackson Hole Airport Board and National Park Service have developed a preliminary list of potential mitigation measures that may be helpful in reducing noise and other environmental impacts of

the airport on the park. These measures have not yet been fully evaluated in terms of their effectiveness, costs and benefits, ease of implementation, availability of funding sources, and consistency with applicable laws, regulations, executive orders, and other mandates.

Some of the measures can and/or will be implemented almost immediately with little or no additional funding requirements or approvals; others may require substantial new funding, or require lengthy planning and/or review and approval processes. Some of the measures would require actions by other agencies, such as the Federal Aviation Administration. Some of the actions may prove to be impractical or have little effect. The National Park Service and Jackson Hole Airport Board will further evaluate these measures, and as required by the 1983 agreement, the Board will update the existing noise abatement plan, through a Federal Aviation Regulations Part 150 process to study new measures to mitigate and reduce the effects of the airport on the park. The Federal Aviation Regulations Part 150 process will include opportunities for public involvement.

The potential mitigation measures identified thus far fall into five general categories –

- Data collection, planning, and analysis;
- Improved technology and new procedures;
- Education and voluntary compliance;
- Noise and access restrictions;
- Measures to address non-noise related environmental impacts.

#### **Data Collection, Planning, and Analysis**

1. **Revise Noise Abatement Plan Based on Federal Aviation Regulations Part 150 Study.** The 1983 agreement includes a provision that requires the Board to review and amend its noise abatement plan to incorporate new prudent and feasible technological advances which would allow further reduction in noise impacts on the park. The current plan has been in effect since 1985. Although the plan itself has not been revised, the Board has complied with the intent of that provision by updating the Federal Aviation Regulations 150 study at intervals between 1985 and 2003, and implementing a variety of noise mitigation measures, including technological advances, to reduce noise impacts on the park. Under either alternative, the Board will undertake an airport noise compatibility study (Part 150 study) update to serve as the basis for revising the existing noise abatement plan.

The primary program under which the Federal Aviation Administration supports local airport noise compatibility planning and projects is contained within Title 14 *Code of Federal Regulations* 150 (Part 150). These regulations were promulgated to implement the Aviation Safety and Noise Abatement Act of 1979 (ASNA), and provide criteria for a voluntary program that allows airport operators to prepare noise exposure maps and recommend measures in a noise compatibility program to reduce noise and non-compatible land uses. Airport operators may submit noise compatibility programs for approval to the Federal Aviation Administration, and may be eligible for Airport Improvement Program funding to implement noise abatement projects. Part 150 studies must comply with the criteria established in the regulations. The existing noise abatement plan for the Jackson Hole Airport was developed pursuant to a Part 150 study that was completed in 1985, and which has been updated periodically.

A Part 150 study is an in-depth process that involves working with the community and other stakeholders to address airport noise issues. These studies require varying amounts of time to

complete, depending on the types of issues and their complexity, and result in the development of measures that may be available to reduce airport noise impacts. The Part 150 study is conducted in accordance with Federal Aviation Administration criteria and requirements. To be eligible for Federal Aviation Administration noise abatement funding, any measures adopted must first be approved by the Federal Aviation Administration.

2. **Prepare Soundscape Management Plan.** The Jackson Hole Airport is but one of many sources of noise that impact the natural soundscapes of Grand Teton National Park. The sounds of motor vehicles are ubiquitous throughout the developed areas of the park, and can also be heard at substantial distance from road corridors. Many other sounds, motor boats, snowmobiles, machinery, power tools, and mechanical equipment can be heard in the park. Under either alternative, the National Park Service will prepare a soundscape management plan for the park to determine how best to protect the natural soundscapes and determine desired future conditions. This may be a desirable prerequisite for any effort to establish goals for the airport and other sources of noise.
3. **Expand Noise Monitoring and Measurement Programs.** The Jackson Hole Airport currently has an advanced noise monitoring and measurement program. The Board maintains five permanently installed noise monitoring stations (four of them in the park and one in a residential community just south of the airport). This noise monitoring program is specifically designed to measure sounds from airport-related aircraft operations. The monitors are located in areas that have been agreed to by the National Park Service and provide data used in determining the Board's compliance with the noise requirements of the 1983 agreement. In addition, with the installation of the Federal Aviation Administration's Air Traffic Control Beacon Interrogator-6 aircraft tracking system at the airport in 2008, each aircraft noise event can be correlated to individual aircraft. This capability can provide the Board and National Park Service with depictions of the noise exposure that is related to specific aircraft operations. For each aircraft arriving at or departing the airport, data are captured that include the aircraft tail number, type of aircraft, and detailed flight track information such as altitude, speed, and heading. Computer software can be used to display the aircraft's noise "footprint as it moves over the park and surrounding areas.

In addition to the Board's noise monitoring equipment and capabilities, Grand Teton National Park maintains fixed and portable state-of-the-art sound monitoring equipment as part of its sound monitoring program. These sound monitors are used at numerous locations to collect data to quantify both natural and non-natural sounds. Aircraft sounds are the specific focus at some of these measurement locations, but the program was not designed to target operations related to Jackson Hole Airport. Many other sounds are of interest including the measurement of the non-natural sounds of road vehicles, over-snow vehicles, utilities, motorboats, and high-flying aircraft, and the identity and extent of the park's many and diverse natural sounds.

Four of the five airport noise monitoring locations are within 4 miles of the airport runway, and the fifth is approximately 6 miles north of the runway. Additional long-term locations tied into the existing airport system might provide data of the airport's operation impacts in areas currently not as well understood. They could also be located in strategic areas to specifically measure the beneficial changes in airport operations resulting from mitigation measures. Another benefit would be that upgraded systems might be used to measure aircraft audibility based on any number of user-defined parameters.

## **Improved Technology and New Procedures**

4. Pursue Implementation of NextGen Approach and Departure. The Next Generation Air Transportation System (NextGen) is the Federal Aviation Administration's plan to modernize the National Airspace System through 2025. This program is intended to address the national growth in air traffic while simultaneously improving safety and reducing environmental impacts. One of the benefits of NextGen is that it will allow precision GPS-based approaches and departures which can be designed to reduce environmental impacts in the areas surrounding airports.

The advantage of NextGen relative to the Jackson Hole Airport is that it could reduce or perhaps eventually eliminate the need for the existing instrument approach to the airport. This approach extends in a straight line from the southern end of Jackson Lake to the threshold of Runway 19, a distance of about 16 miles. When and if available, GPS-based curved approaches and departures would use much less of the airspace over the park, and could therefore allow aircraft to approach or depart the airport with much less effect on the park. The Board is currently working with the Federal Aviation Administration and NetJets to develop a pilot program to evaluate a precision approach around Blacktail Butte with a short final to Runway 19. A similar approach is commonly used by aircraft under visual flight rules, but NextGen could make it available for IFR approaches. Under either alternative, the Board, in cooperation with the National Park Service, will continue to work with the Federal Aviation Administration to develop and seek early implementation of NextGen approach and departure procedures for the Jackson Hole Airport.

5. Pursue Establishment of New Instrument Approach to Runway 19. About 85% of arrivals to the airport occur on Runway 19, although many of these are visual approaches that overfly only a small area of the park near the airport. Instrument arrivals to Runway 19 typically involve navigating to the DUNOIR (DNW) VOR, which is located on Rosie's Ridge, approximately 8 miles east of Moran Junction. From that point, the approach proceeds west to a point over Jackson Lake near Signal Mountain, at which point the localizer is intercepted. Once on the localizer, the approach proceeds south, directly to the airport for a straight in landing on Runway 19. Aircraft are typically at about 13,000 to 14,000 feet above mean sea level crossing DNW. Once on the localizer, aircraft descend from about 11,000 feet to the airport's elevation of 6,451 feet.

Under Alternative 2, the Board, in cooperation with the National Park Service, would work with the Federal Aviation Administration to determine whether a new instrument approach could be developed to reduce noise impacts on the park. Moving the VOR and/or moving the localizer intercept point further south could potentially reduce aircraft time aloft over the park. Further study and modeling would be necessary to determine what effects a new approach would have on the park, as well as on surrounding wilderness areas.

6. Pursue Establishment of a Precision Approach to Runway 01. As noted above, the majority of landings at the Jackson Hole Airport utilize Runway 19, landing from north to south. Installation of a precision approach to Runway 01, either GPS-based or guided by an ILS, could potentially reduce the number of aircraft utilizing the ILS approach to Runway 19, thereby reducing noise impacts on the park. Even with a precision approach to Runway 01, use of Runway 19 for landing would continue at times when the prevailing southerly winds, departing traffic, and/or other factors dictated the approach direction.

A GPS-based approach as discussed above may be possible. Under Alternative 2, the Board, in cooperation with the National Park Service, would further evaluate whether different or emerging technologies could make a precision approach to Runway 01 feasible.

7. **Reduced Power Takeoffs and Reduced Use of Reverse Thrust.** The use of reduced power on takeoff can be used to lessen wear and tear on aircraft engines, as well as reducing noise. The use of reverse thrust on landing is used to slow the aircraft quickly and reduce wear and tear on brakes. Both high takeoff power settings and use of reverse thrust contribute to higher noise impacts near airports.

The relatively short length of the airport's runway, as well as its high altitude (which results in higher operating speeds on the runway) currently make either of these noise reduction measures impractical and unsafe for most jet operations at the Jackson Hole Airport. It is unknown whether future improvements in aircraft and navigation technologies could make such measures feasible.

### **Education, Incentives, and Voluntary Compliance**

8. **Enhance Educational Efforts with Aircraft Owners, Operators, and Pilots.** The Board currently meets with airline chief pilots on at least an annual basis regarding airport operations and noise abatement procedures. It also communicates regularly with control tower personnel, the fixed-base operator, and others who have a role in airport operations. The Board also provides information on airport operations and noise abatement procedures through a wide variety of media that are normally used by pilots in flight planning. Under Alternative 2, the Board and National Park Service would develop further outreach procedures and products to enhance the information provided to pilots, and would also meet with representatives of the Federal Aviation Administration to encourage air traffic control procedures into and out of the airport that would facilitate pilot compliance with noise abatement procedures to the maximum extent consistent with the safety of operations. The National Park Service would actively participate in outreach meetings with airline personnel, aircraft owners and operators, Federal Aviation Administration and control tower personnel, and others to encourage operations that minimize impacts on the park.
9. **Develop and Implement a Fly Quiet Program.** Fly Quiet programs have been implemented at several airports. These programs seek to influence airlines and other aircraft operators to operate as quietly as possible, and typically use a variety of incentives to reward aircraft operators and airlines for operations that reduce noise. For example, this could include developing fleet quality measures for airlines and fractional/charter aircraft and track improvements over time. Operators could be recognized with environmental awards for improvements in fleet quality. Under Alternative 2, the Board would develop and implement a Fly Quiet program for the Jackson Hole Airport.
10. **Increase the Number of Hours Voluntary Curfew is in Effect.** In 2004, the Jackson Hole Airport Board adopted a voluntary curfew, with a system of notifying owners of aircraft that violate the curfew by letter and requesting them to refrain from further violations. The curfew applies to general aviation aircraft, and is between the hours of 11:30 p.m. and 6:00 a.m. for landing, and 10:00 p.m. and 6:00 a.m. for takeoff.

The curfew has been largely successful, with only a few violations per month on average. One reason for the high rate of compliance may be the perceived reasonableness of the restricted hours. Since the measure is voluntary, further restriction may have a limited effect and simply increase the number of violations. However, even assuming a similar level of compliance, the effects of further restricting the hours would apply to only a small number of takeoffs and landings and would have little effect on the overall noise impacts of the airport. Rather than reducing the number of operations, takeoffs and landings would be compressed into the hours that

the curfew was not in effect. Under either alternative, the Board, in consultation with the National Park Service, will continue to monitor the effectiveness of the voluntary curfew and determine whether any changes are warranted.

### **Noise and Access Restrictions**

The primary program under which the Federal Aviation Administration supports local airport noise compatibility planning and projects is contained within Title 14 *Code of Federal Regulations* 150 (Part 150). The regulations were promulgated to implement the Aviation Safety and Noise Abatement Act of 1979 (ASNA), and provide criteria for a voluntary program that allows airport operators to prepare noise exposure maps and recommend measures in a noise compatibility program to reduce noise and non-compatible land uses. Airport operators may submit noise compatibility programs for approval to the Federal Aviation Administration, and may be eligible for Airport Improvement Program funding to implement noise abatement projects. Part 150 studies must comply with the criteria established in the regulations. The existing noise abatement plan for the Jackson Hole Airport was developed pursuant to a Part 150 study that was completed in 1985. It has been updated at intervals from 1985 to 2003.

As a result of concerns over a proliferation of uncoordinated and inconsistent noise and access restrictions at airports throughout the United States, Congress enacted the Airport Noise and Capacity Act of 1990 (ANCA). ANCA established a comprehensive national policy for regulating aviation noise, established criteria for noise and access restrictions at U.S. airports, and provided for an orderly phase-out of older and noisier Stage 2 aircraft weighing over 75,000 pounds. Under ANCA, a noise or access restriction on Stage 3 aircraft may become effective only if it is agreed to by all aircraft operators using the airport, or it is submitted to and approved by the Federal Aviation Administration following a detailed study and notice process. The Federal Aviation Administration will approve a restriction only if it meets six statutory conditions specified in ANCA:

- The restriction is reasonable, non-arbitrary, and non-discriminatory;
- The restriction does not create an undue burden on interstate or foreign commerce;
- The restriction is not inconsistent with maintaining the safe and efficient use of the navigable airspace;
- The restriction does not conflict with a law or regulation of the United States;
- An adequate opportunity has been provided for public comment on the restriction; and
- The restriction does not create an undue burden on the national aviation system.

Pursuant to the Airport Noise and Capacity Act, the Federal Aviation Administration developed implementing regulations codified at 14 *Code of Federal Regulations* 161 (Federal Aviation Regulations Part 161). The regulations establish a national program for the review of airport noise and access restrictions, and outline the information that the Federal Aviation Administration considers essential to demonstrate the substantial evidence required to support the six conditions for approval of a restriction. The Part 161 regulations also require that the measurements of noise levels at airports and surrounding areas, and the land uses that are normally compatible or non-compatible with various noise exposure levels be identified in accordance with the procedures established in Part 150.

As an example of the types of information that must be provided to the Federal Aviation Administration, the essential information needed to show that the first condition has been satisfied includes 1) evidence that a current or projected noise or access problem exists, and that the proposed action

could relieve the problem; 2) evidence that other available remedies are infeasible or would be less cost effective; and 3) evidence that the noise or access standards are the same for all aviation users classes, or that the differences are justified. Typically, the type and amount of data, the rigor of the analysis, and other information needed for Federal Aviation Administration review require a lengthy, time consuming, and costly Part 161 study process. This process has never before been applied in a national park setting.

In the 20 years since the Airport Noise and Capacity Act was enacted, no airport has been successful in imposing a noise or access restriction on Stage 3 aircraft. The Jackson Hole Airport Board imposed a prohibition on the use of Stage 2 aircraft under 75,000 lbs only after obtaining legislative authority in a rider on the 2003 Federal Aviation Administration reauthorization act.

The National Park Service and Jackson Hole Airport Board recognize that the requirements of the Airport Noise and Capacity Act and Part 161, which were not in effect in 1983, make it significantly more difficult to impose noise and access restrictions than it was when the agreement was first signed. With that in mind, the National Park Service and Board have identified a preliminary list of potential measures for consideration to further reduce the impacts of the airport on the Park. If it is determined that any of the following measures should be pursued, such measures could be implemented only with Federal Aviation Administration approval following the completion of a Federal Aviation Regulations Part 161 process.

11. Establish a Mandatory Curfew. In 2004, the Jackson Hole Airport Board adopted a voluntary curfew, with a system of notifying owners of aircraft that violate the curfew by letter and requesting them to refrain from further violations. The curfew applies to general aviation aircraft, and is between the hours of 11:30 p.m. and 6:00 a.m. for landing, and 10:00 p.m. and 6:00 a.m. for takeoff. The curfew has been largely successful, with only a few violations per month on average. One reason for the high rate of compliance may be the perceived reasonableness of the restricted hours. A mandatory curfew would likely have little effect on aviation noise associated with the airport because very few operations normally occur during voluntary curfew hours.
12. Reduce the Single-Event Noise Limit. The 1983 agreement includes a provision that no aircraft louder than 92 dBA on approach, by reference to Federal Aviation Administration Circular 36-3H, may use the airport. The noise levels for each aircraft in the circular are determined through certification of measurements at a specified distance from the runway threshold. With the advent of the stage classification system for aircraft noise, the measurement procedures are different and take into consideration the size/weight of the aircraft as well. Definitions for each of the stages are found in 14 *Code of Federal Regulations* 36.
13. Impose Limits on the Number of Operations. As recorded by the air traffic control tower, there are approximately 140 operations per day at the Jackson Hole Airport during the peak summer season. One way of reducing noise impacts on the park would be to reduce the number of operations. Any such limit would have to be established and implemented in a manner consistent with applicable laws and regulations. At a minimum, it would have to apply equally to all classes of aviation users utilizing the airport.
14. Establish Noise Reduction Targets. The 1983 agreement includes performance requirements related to noise, using the DNL metric to determine whether the Board is in compliance. Specifically, the Board is required to ensure that the 55 DNL contour does not extend into areas of the park that are defined in the agreement as noise sensitive, and furthermore that the 45 DNL contour does not extend west or north of a specified restriction line. The Board has been, and con-

tinues to be in compliance with these requirements, and has demonstrated its compliance through an annual noise report every year since 1986.

The Federal Aviation Administration employs DNL as the metric to be used in determining noise exposure due to its usefulness in correlating the cumulative exposure of individuals with various levels of annoyance. However, the National Park Service believes that other metrics are more useful in describing the impacts of noise on the natural soundscapes of parks. For example, percent-time audible and various time-above metrics (for example, time above 60 DBA) are useful in describing how the natural soundscapes of a park are affected. One possible way of addressing the impacts of the airport on the park would be to redefine the performance requirements in terms of metrics that are designed to be more appropriate to a national park setting.

15. **Designate Restricted Airspace.** In a 1983 letter to Transportation Secretary Elizabeth Dole, Secretary of the Interior James Watt requested that the Federal Aviation Administration restrict the use of the airspace over noise sensitive areas of Grand Teton National Park. As an interim measure, Secretary Watt asked for a restriction that would specify a minimum altitude of 3,000 feet above ground level over noise sensitive areas of the park, except for operations into and out of the airport. The purpose of both requests was to reduce noise associated with overflights. In March 1984 response letter, the Federal Aviation Administration declined to impose such an airspace restriction, noting that it did not have any special airspace dedicated to environmental issues, and that the operations at the airport did not warrant restricted airspace. The installation of the air traffic control tower in 2000 has established a Class D restricted airspace within a 5-mile radius of the tower, up to an elevation of 3,000 feet above ground level.
16. **Eliminate Victor Airways 520 and 311.** These established air routes bisect the park from east to west, with a minimum enroute altitude of 15,000 feet above mean sea level. Neither is used frequently. Secretary Watt also requested in his 1983 letter that the Federal Aviation Administration eliminate V520. The Federal Aviation Administration declined, noting that such an action could have the unintended consequence of reducing the altitudes of enroute aircraft. The route has a minimum enroute altitude of 15,000 feet, but if it were eliminated IFR flights could occur as low as 13,000 feet above mean sea level. The National Park Service will consult with the Federal Aviation Administration regarding whether any revisions to the airways or airspace could result in reducing aircraft noise exposure on the park.
17. **Enhance Compliance with Use of Preferential Runway.** The 1983 agreement states “to the extent feasible, the Board will limit airport approaches from and departures to the north, and encourage pilots taking off to or approaching from the north to maintain a course east of U.S. Highway 26/89 north of Moose.” The Board has made this preference well known to pilots and it is also encouraged by the control tower. Nonetheless, primarily because of the prevailing winds, the vast majority of departures are made to the south. For the same reason, most landings are made from the north onto Runway 19. Although many approaches involve flying the 16-mile ILS from Jackson Lake to the airport, a substantial number fly over only a small part of the park near the airport. For example, under VFR conditions, aircraft arriving from the south or east will often proceed to a point just north and east of Blacktail Butte and then enter a left 180-degree turn to fly a short final from approximately Moose to the airport.

Mandatory use of Runway 01 for landings and Runway 19 for takeoffs would have serious implications for safety due to the direction of the prevailing winds. The length of the runway and its high elevation necessitate that operations occur into the wind in most circumstances. In addition, contra-flow operations would pose safety concerns because of potential conflicts be-

tween departing and arriving aircraft. Furthermore, when the ILS approach is required, the only ILS is for Runway 19. A mandatory restriction to enforce use of the preferential runway would require Federal Aviation Administration approval and would likely be denied for safety reasons.

The Board and National Park Service will continue to monitor runway utilization and consistency with the preferential use provisions of the agreement. In addition, the Board and National Park Service will review data on wind speed and direction and other factors influencing runway utilization, and will work with the Federal Aviation Administration and the air traffic control tower to determine how to improve preferential runway use.

18. **Restrict or Limit the Amount of the Airport Available to Support General Aviation.** The existing aircraft ramp is divided into a general aviation ramp and a more secure air carrier ramp. Approximately 65% of the ramp is for general aviation, and the remaining 35% is for air carrier. As air carrier needs have expanded over the years, the portion available to general aviation has been reduced. During most times of the year, the general aviation ramp is adequate to accommodate general aviation demand. However, during peak times the ramp is not adequate and excess general aviation aircraft must either divert to another airport, or in the case of corporate jet aircraft, it is more likely to result in passengers being dropped off and picked up later, with the aircraft being flown to another airport during the intervening time.

If less of the ramp were available to support general aviation, it is possible that the number of general aviation operations would be reduced. However, with respect to larger (and noisier) corporate jet aircraft, the number of operations could potentially increase. When there is no room for larger general aviation aircraft to remain at the airport, they usually drop off passengers and go to another airport and return. A reduction in ramp capacity therefore could potentially increase the number of operations and the resulting aircraft noise.

The Board is required by federal law to make the airport available “to all types, kinds and classes of aeronautical activity on fair and reasonable terms.” If limiting the space available for general aviation purposes occurs in conjunction with an expansion of use by the Board for other aviation-related purposes, such as commercial aviation, then this is generally permissible. However, any restriction on general aviation which is not connected with another aviation use (such as a stand-alone restriction as a noise mitigation measure) would be contrary to federal law.

19. **Use Incentives to Reduce Impacts of General Aviation.** The voluntary curfew on landings and takeoffs that is currently in effect has been successful in reducing late night operations at the airport, although several violations typically occur each month. Currently, the airport’s fixed-base operator (FBO) charges a higher rate for its services after curfew hours due to the additional expense of keeping employees on late, or recalling them after hours. Although the higher charges are intended to address legitimate business operations and costs, an incidental effect may be to encourage compliance with the voluntary curfew.

Similar market-based incentives could potentially be used to encourage charter and general aviation aircraft operators modify behaviors in a manner that would reduce impacts on the park. However, if intended primarily to address noise, and/or serve as a restriction on use, such measures would be subject to the Federal Aviation Regulations Part 161 approval process.

### **Other Mitigation and Environmental Protection Measures**

20. **Construct Glycol Recovery System.** Propylene glycol is used for deicing aircraft. Prior to 2008, glycol that did not remain on the aircraft was allowed to simply evaporate from the ramp or be

handled with storm water runoff. In 2008, the Board obtained a vacuum truck to remove glycol from the ramp and began trucking it to a Salt Lake City area recycle facility. The Board currently has a project in the airport's capital improvement plan to design and construct a deicing pad that would collect and recover glycol in a designated tank. When completed, such a system will significantly reduce glycol runoff into the storm water system. In addition, glycol use could be reduced by using forced air to blow accumulated snow from an aircraft, rather than using glycol to melt it.

21. **Further Reduce the Effects of Fugitive Light Emissions.** Sources of light emissions from the airport include airfield lighting, such as runway, taxiway, approach, and other lighting systems designed to guide aircraft operations; parking lot lights, external building lights in and around pedestrian or vehicle movement areas. Light emissions have been reduced by a variety of measures. Pilot-activated runway lights remain off unless activated by a pilot prior to landing or takeoff. Certain portions of the parking lot are left unlighted after the last scheduled arrival at night. Lights on the ramp are shielded, and parking lot lights are of low intensity. Additional measures to curb light emissions could include the use of LED lights where applicable/feasible, further reduce the time pilot-activated runway lights remain on (currently 15 minutes), and installation of motion-activated lighting systems.

Under Alternative 2, the Board, in consultation with the National Park Service, would periodically review airport light emissions and the effects on night skies to determine any additional measures and new technology that may be used to reduce the effects of airport lighting.

22. **Reduce Energy Consumption.** The Board has recently issued a request for proposals to begin the process of pursuing ISO 14001 certification. There are numerous actions that could be taken to reduce energy consumption, including limit idle time for vehicles and equipment (applicable to the airport, tenant, and contractors), use of LED lighting, replace gasoline-powered fleet vehicles with electric, LNG, or hybrid vehicles, and provide incentives for rental car companies to include hybrid or high mileage vehicles in their fleets. Motion-activated lighting or reductions in the duration of pilot-activated lighting could also reduce energy consumption, as could use of alternative energy sources to power some lighting systems, such as parking lot lights. The use of mobile ground power units for aircraft could be reduced or eliminated by providing 440V 200 amp power connections.
23. **Conversion of Boilers, Generators, and Other Ground Equipment to Clean Energy Sources.** In addition to the energy saving measures described above, under Alternative 2 the Board would pursue conversion of its boilers and stand-by electrical generators from fuel oil or diesel to clean energy sources such as propane or natural gas.
24. **Visual Quality and Vegetation/Habitat.** The Board has planted trees and other vegetation at many locations on and around the airport perimeter, masking its presence from various locations. Under Alternative 2, this practice would be continued to further screen the airport, such as by planting trees along the access road and in other areas. Grasses could be planted in the unpaved but disturbed areas beyond the runway, and in other areas, to reduce the heat plume.
25. **Wildlife.** Under either alternative, the Board and National Park Service will collaborate to develop procedures, methods, and strategies regarding techniques to minimize conflicts between sage grouse and aircraft. The lek at the north end of the runway has been present for decades, despite the presence of aircraft. In cooperation with the National Park Service, the Board will develop procedures, methods, and strategies to minimize conflicts between sage-grouse and aircraft operations. In addition, the National Park Service and Board will collaborate on funding

research studies that could help determine whether the airport is affecting other wildlife, such as gleaning bats and insects that may be sensitive to noise and light emissions.