APPENDIX A

DRIGGS-REED MEMORIAL AIRPORT
AIR QUALITY/CLIMATE AND NOISE ASSESSMENT

Prepared by:
KB Environmental Sciences, Inc.

Prepared for:
Jviation, Inc.

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1. INTRODUCTION

This report documents the methodologies, and presents the findings of air quality, climate and noise assessments that were conducted to support the Environmental Assessment (EA) that is being prepared for proposed improvements at Driggs-Reed Memorial Airport (DIJ). The proposed improvements would shift the existing Runway 4-22 to the northeast, provide a parallel taxiway, and relocate an access road.

2. AIR QUALITY AND CLIMATE

The following provides an overview of the regulatory framework for which the air quality and climate assessments were prepared and describes existing air quality and climate conditions (i.e., the affected environment) within the EA's study area. Potential air quality and climate impacts (i.e., environmental consequences) with the improvements (Proposed Action) and without the improvements (No Action) are presented in Section 2.1.

2.1 Regulatory Agencies

At the federal level, under the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) establishes the guiding principles and policies for protecting air quality conditions in the study area (and throughout the nation). EPA's primary responsibility is to promulgate and update National Ambient Air Quality Standards (NAAQS)[1] which define outdoor levels of air pollutants that are considered safe for the health and welfare of the public. The EPA's other responsibilities include the approval of State Implementation Plans (SIPs)—plans that detail how a state will comply with the CAA.

The Federal Aviation Administration (FAA) is the primary agency involved in, and responsible for, ensuring that air quality impacts associated with proposed airport projects adhere to the reporting and disclosure requirements of the National Environmental Policy Act (NEPA) as well as the General Conformity Rule of the CAA. The General Conformity Rule is applicable to non-highway projects that are federally funded, licensed, permitted, or approved. The rule ensures that project-related air pollutant emissions do not contribute to the degradation of air quality conditions in an area.

At the state level, the Idaho Department of Environmental Quality (IDEQ) is the primary authority for ensuring that the federal (and state) air quality regulations are met. The IDEQ is responsible for air quality monitoring throughout the state as well as the development and implementation of SIPs. The permitting of stationary emission sources, the regulation of mobile source emissions, and emission reduction programs are also under the jurisdiction of the IDEQ. DIJ is located in Teton County, Idaho. In Idaho, local government agencies rely on the IDEQ for environmental regulations, air quality permitting, and air quality monitoring.

2.2 NAAQS

The CAA requires the EPA to establish and periodically review NAAQS. There are NAAQS for six "criteria" air pollutants—carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), and sulfur dioxide (SO_2). There are standards for two sizes of PM—$PM_{2.5}$ which are particles with a diameter of 2.5 microns or less and PM_{10} which are particles with a diameter of 10 microns or less. For some pollutants there are two sets of standards. Primary standards provide protection for the health of the public and secondary standards provide public welfare protection. The NAAQS for the six air pollutants and the averaging periods of the standards are provided in **Table 1**.

[1] EPA, National Ambient Air Quality Standards (NAAQS) at https://www.epa.gov/criteria-air-pollutants/naaqs-table, May, 2020.

Table 1 – National Ambient Air Quality Standards				
Pollutant		Primary/ Secondary	Averaging Period	Standard
CO		Primary	8-hour	9 ppm
			1-hour	35 ppm
Pb		Primary and Secondary	Rolling 3-month average	0.15 µg/m^3
NO_2		Primary	1-hour	100 ppb
		Primary and Secondary	1 year	53 ppb
O_3		Primary and Secondary	8-hour	0.070 ppm
PM	$PM_{2.5}$	Primary	1 year	12 µg/m^3
		Secondary		15 µg/m^3
		Primary and Secondary	24-hour	35 µg/m^3
	PM_{10}	Primary and Secondary	24-hour	150 µg/m^3
SO_2		Primary	1-hour	75 ppb
		Secondary	3-hour	0.5 ppm

Notes: ppb = parts per billion, ppm = parts per million, and µg/m^3 = micrograms per cubic meter of air.
Source: EPA https://www.epa.gov/criteria-air-pollutants/naaqs-table, August 2020.

2.3 Air Quality Designation

The EPA designates areas as either attainment or nonattainment. An area with measured pollutant concentrations which are lower than the NAAQS is designated attainment and an area with pollutant concentrations that exceed the NAAQS is designated nonattainment. Once a nonattainment area meets the NAAQS and the additional re-designation requirements in the CAA, the EPA re-designates the area to be "maintenance". Areas are designated as unclassifiable when there is lack of sufficient data to form the basis of an attainment status determination. As previously stated, DIJ is located in Teton County, an area that is designated to in attainment of all of the NAAQS.

2.4 CAA Conformity Requirements

The General Conformity Rule of the federal CAA prohibits federal agencies (including the FAA) from permitting or funding projects that do not conform to an applicable SIP. The General Conformity Rule applies only to areas that are designated nonattainment or maintenance. Because DIJ is located in an attainment area, the General Conformity requirements of the CAA are not applicable to the Proposed Action.

The CAA also contains a Transportation Conformity Rule that functions similar to the General Conformity Rule. The Transportation Conformity Rule restricts federal funding to highway or transportation projects that do not conform to an applicable SIP. The responsibility of transportation conformity determination is vested in the Federal highway Administration (FHWA) and a state's Department of Transportation. Because DIJ is located in an attainment area, the Transportation Conformity requirements of the CAA are also not applicable to the Proposed Action.

2.5 National Environmental Policy Act (NEPA) Requirements

Section 102(2) of the NEPA requires environmental review of federally-funded projects that have the potential to affect the environment irrespective of location (i.e., nonattainment/attainment/maintenance areas). The emission inventories presented in Section 3, which disclose emission levels of the criteria pollutants and/or their precursors with the No Action and Proposed Action alternatives, as well as inventories of greenhouse gases (GHGs), were prepared for the NEPA-required environmental review.

2.6 Climate

Research has shown that an increase in atmospheric GHG emissions is significantly affecting the Earth's climate. These conclusions are based upon a scientific record that includes substantial contributions from the United States Global Change Research Program (USGCRP)—a program mandated by Congress in the Global Change Research Act to "assist the Nation and the world to understand, assess, predict, and respond to human-induced and natural processes of global change.[2] In 2009, based primarily on the scientific assessments of the USGCRP, as well as the National Research Council (NRC) and the Intergovernmental Panel on Climate Change (IPCC), the EPA issued a finding that it was reasonable to assume that changes in our climate caused by elevated concentrations of GHG in the atmosphere endanger the public health and public welfare of current and future generations.[3] In 2015, EPA acknowledged more recent scientific assessments that "highlight the urgency of addressing the rising concentration of carbon dioxide (CO_2) in the atmosphere".[4]

The EPA and the FAA traditionally work within the standard-setting process of the International Civil Aviation Organization's (ICAO) Committee on Aviation Environmental Protection (CAEP) to establish international emission standards and related requirements, which individual nations later adopt into domestic law. In February of 2016, ICAO/CAEP agreed on the first-ever international standards to regulate CO_2 emissions from aircraft. In July of 2016 the EPA formally announced that GHG emissions from certain classes of aircraft engines contribute to climate change. In March of 2017, the ICAO Council adopted a new aircraft CO_2 emissions standard which will reduce the impact of aviation GHG emissions on the global climate.[5]

Although there are currently no federal standards for aviation-related GHG emissions, it is well-established that GHG emissions can affect climate. The CEQ has indicated that climate should be considered in NEPA analyses and in 2016 released the final guidance titled "Final Guidance for Federal Departments and Agencies on Consideration of GHG Emissions and the Effects of Climate Change in NEPA Reviews," for federal agencies on how to consider the impacts of their actions on global climate change in their NEPA reviews, a Notice of Availability for which was published on August 5, 2016 (81 FR 51866). However, pursuant to Executive Order 13783 of March 28, 2017, "Promoting Energy Independence and Economic Growth," the final guidance was withdrawn effective April 5, 2017 for further consideration. Notably, on June 21, 2019, the CEQ submitted draft guidance titled "Draft NEPA Guidance on Consideration of GHG Emissions," to the Federal Register for publication and public comment. The public comment period was originally set to close on July 26, 2019, but was extended to August 26, 2019. If finalized, this guidance would replace the final guidance CEQ issued in August 2016.[6,7]

2.7 Potential Air Quality and Climate Impacts

This section presents and discusses the estimated change in air pollutants, pollutant precursors, and GHGs that would result with the Proposed Action at DIJ. For the analysis, the short-term pollutant/pollutant precursor emissions that would result from the construction activities required to implement the improvements as well as long-term emissions with the No Action and Proposed Action alternatives were derived.

2.7.1 Construction Emissions

Air pollutant emissions associated with construction activities are temporary and variable depending on project location, duration and level of activity. These emissions occur predominantly in engine exhaust from the operation of construction equipment and vehicles at the site (e.g., scrapers, dozers, delivery trucks, etc.) and from

[2] Global Change Research Act of 1990, Pub. L. 101–606, Sec. 103 (November 16, 1990), http://www.globalchange.gov.

[3] Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66496 (December 15, 2009).

[4] EPA, Final Rule for Carbon Pollution Emission Guidelines for Existing Stationary Sources Electric Utility Generating Units, 80 Fed. Reg. 64661, 64677 (October 23, 2015).

[5] ICAO, https://www.icao.int/Newsroom/Pages/ICAO-Council-adopts-new-CO2-emissions-standard-for-aircraft.aspx.

[6] Executive Office of the President of the U.S., Council on Environmental Quality Initiatives, Fact Sheet: CEQ'S Draft NEPA Guidance on Consideration of GHG Emissions, https://www.whitehouse.gov/wp-content/uploads/2017/11/20190724-FINAL-GHG-Guidance-Fact-Sheet-FR-Notice-Comment-Extension.pdf.

[7] Council on Environmental Quality, Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions, [Docket No. CEQ-2019-0002], June 26, 2019. Available at: https://www.govinfo.gov/content/pkg/FR-2019-06-26/pdf/2019-13576.pdf.

transporting construction workers to and from the site. Additionally, fugitive dust emissions result from site preparation, land clearing, material handling, equipment movement on unpaved areas; and from evaporative emissions that occur during the application of asphalt paving.

The construction equipment typically utilized in airport projects is comprised both of on-road vehicles (i.e., on-road-licensed) and non-road equipment (i.e., off-road). The former category of vehicles are used for the transport and delivery of supplies, material and equipment to and from the site and includes construction worker vehicles. The latter category of equipment is operated on-site for activities such as soil/material handling, site clearing and grubbing.

The Airport Construction Emissions Inventory Tool (ACEIT)[8] and EPA's MOtor Vehicle Emission Simulator (MOVES)[9] were used to estimate short-term construction emissions associated with the proposed improvements at DIJ. The emission inventories were prepared for the air pollutants carbon monoxide (CO) and particulate matter (PM)[10]. Estimates of volatile organic compounds (VOCs) and nitrogen oxides (NO_x), which are precursors to the air pollutant O_3, were also prepared. While MOVES does not provide emission estimates of nitrogen dioxide (NO_2) or sulfur dioxide (SO_2), the model does provide estimates of NO_X and SO_X emissions of which NO_2 and SO_2 are components, respectively.

Project-specific details (i.e., project types and square footages) were used in the ACEIT to estimate construction activities and equipment/vehicle activity data (e.g., equipment mixes/operating times). Because the default emission factors used by ACEIT are outdated and do not reflect the emission rates from the MOVES model, only activity data was extracted from ACEIT. Emission factors were then developed using MOVES, which provides emissions data for both on-road vehicles and off-road construction equipment. Fugitive dust emissions were estimated using emission factors within EPA's Compilation of Air Pollutant Emission Factors (AP-42)[11] and evaporative emissions were developed using EPA guidance on asphalt paving.[12]

Table 2 lists the construction activities that would be necessary to implement the Proposed Action at DIJ. For the purpose of preparing the inventory, construction of the proposed improvements was assumed to begin in the year 2027 and continue through the year 2029. The emissions inventory of CO, PM, VOC, NO_x, and SO_x that would result from construction of the proposed improvements at DIJ are provided in **Table 3**. As shown, the greatest level of collective emissions would occur in the year 2028.

Table 2 – Construction Schedule and Activities

Timeframe	Construction/Demolition Activities
2027	Site preparation (e.g., grading)
2028	Construct new segment of runway and taxiway connectors, relocate existing entrance road, demolish abandoned runway and taxiway connectors
2029	Construct wildlife fencing

Source: Jviation, Inc., 2020.

[8] TRB, ACRP Report 102, Guidance for Estimating Airport Construction Emissions, http://www.trb.org/ACRP/Blurbs/170234.aspx.
[9] EPA's MOVES2014b is the latest version of MOVES, which includes the NONROAD model. Additional information on MOVES2014b is available at https://www.epa.gov/moves/latest-version-motor-vehicle-emission-simulator-moves.
[10] The PM inventories were prepared for particles 10 micrometers or less in diameter (PM10) and 2.5 micrometers or less in diameter (PM2.5).
[11] EPA, Emissions Factors & AP-42, Compilation of Air Pollutant Emission Factors,https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors.
[12] EPA, Emission Inventory Improvement Program, Asphalt Paving, Chapter 17, Volume III, April 2001.

Table 3 – Construction Emissions (tons)						
Year	**CO**	**PM_{10}**	**$PM_{2.5}$**	**VOC**	**NO_x**	**SO_x**
2027	2	3	<1	<1	3	<1
2028	2	3	<1	1	5	<1
2029	<1	<1	<1	<1	<1	<1
Emission estimates are rounded. Source: KB Environmental Sciences, Inc., 2020.						

2.7.2 Operational Emissions

The Proposed Action has the potential to change the level of air pollutant/pollutant precursor emissions associated with the aircraft taxi mode as well as motor vehicle emissions due to the relocation of the entrance road. Because there would be no change in the number of aircraft operations or motor vehicle trips or change in the aircraft or motor vehicle fleet mix, the change in operational emissions would only occur from a change in the aircraft taxi and motor vehicle travel distances.

Aircraft taxi emissions with and without the Proposed Action were computed using the FAA's Aviation Environmental Design Tool (AEDT), Version 3c.[13] The average time that aircraft would taxi with the No Action and Proposed Action alternatives is provided in **Table 4**. The taxi times were derived an assuming a taxi speed of ten miles-per hour and measured distances to/from the ends of Runway 4-22 with and without the Proposed Action.

Table 4 – Aircraft Taxi Times			
Runway End	**Taxi Times (minutes)**		
	No Action	**Proposed Action**	**Difference**
4	1.09	2.34	1.25
22	8.73	11.06	2.33
Source: KB Environmental Sciences, Inc., 2020.			

Motor vehicle-related emissions were not calculated because the level of daily traffic on the entrance roadway would be minimal (activity associated with the few residences in the area) and, while the motor vehicle trips originating west of the airport would be longer, the trips originating from the east would be shorter (i.e., essentially no change in the vehicle miles traveled with our without the Proposed Action).

Aircraft operation levels were obtained from the DIJ Master Plan[14]. **Table 5** summarizes the aircraft fleet mix and number of annual aircraft operations modeled in AEDT for the 2018, 2029 and 2034 conditions.

[13] AEDT 3c is the current release version of AEDT. Additional information on AEDT is available at: https://aedt.faa.gov/.
[14] DIJ Master Plan, Chapter 3 – Forecasts, 2019.

Table 5 – Aircraft Fleet Mix and Operations

AEDT ANP	Airframe Name	Engine	Number of Operations		
			2018	2029	2034
CNA500	Cessna 500 Citation I	JT15D-4 series	265	411	480
CL600	Bombardier Challenger 600	CF34-3B	206	319	373
CNA750	Cessna 750 Citation X	AE3007C	206	318	371
CNA510	CESSNA CITATION 510	PW610F	192	297	347
CNA55B	Cessna 550 Citation II	JT15D-4 series	147	228	267
LEAR35	Bombardier Learjet 35	TFE731-2-2B	103	160	187
CNA560XL	Cessna 560 Citation XLS	PW306B	74	114	133
FAL900EX	Dassault Falcon 900-EX	TFE731-2/2A	59	91	107
CNA560U	Cessna 560 Citation V	JT15D-5, -5A, -5B	59	91	107
GIV	Gulfstream G400	TAY Mk611-8	59	91	107
CNA525C	Cessna 525 CitationJet	PW4090	29	46	53
CIT3	Cessna 650 Citation III	TFE731-2-2B	29	46	53
IA1125	Israel IAI-1125 Astra	TFE731-3	15	23	27
GV	Gulfstream G500	BR700-710A1-10	15	23	27
BD-700-1A10	Bombardier Global Express	BR700-715A1-30	15	23	27
CNA208	Cessna 208 Caravan	PT6A-114	258	412	461
DHC6	DeHavilland DHC-6-300	PT6A-27	222	354	397
CNA441	Cessna 441 Conquest II	TPE331-8	120	191	214
GASEPV	Piper PA46 Meridian	PT6A-42	3,681	3,801	4,025
COMSEP	Cirrus SR22	TIO-540-J2B2	2,310	2,841	3,157
CNA172	Cessna 172 Skyhawk	IO-360-B	2,236	2,789	3,110
GASEPF	Aero Commander	IO-360-B	2,199	2,763	3,085
BEC58P	Raytheon Beech Baron 58	TIO-540-J2B2	975	1,053	1,180
B206L	Bell 206L-4T Long Ranger	250B17B	1,050	1,746	2,070
SPORT	Robin Alpha Sport	IO-320-D1AD	450	873	1,035
T-2C	Rockwell T-2 Buckeye	J85-GE-2	13	20	23
A4C	MD A-4 Skyhawk	J52-P-408	13	20	23
		Total	**15,000**	**19,144**	**21,446**

Source: KB Environmental Sciences, Inc., 2020.

Table 6 presents the aircraft-related operational emission inventories for the future No Action and Proposed Action conditions. As shown, with the Proposed Action, operational emissions are estimated to increase with the greatest increase being emissions of CO and VOC (an increase of three tons and approximately one ton, respectively). The increase in emissions would occur because the aircraft taxi times are greater with the proposed shift of Runway 14-32.

Table 6 – Aircraft Taxi Emissions (tons)							
Year	**Alternative**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**VOC**	**NO_x**	**SO_x**
2029	No Action	13.7	0.03	0.03	2.6	0.4	0.2
	Proposed Action	16.4	0.03	0.03	3.1	0.5	0.2
	Net Difference	**2.7**	**<0.01**	**<0.01**	**0.5**	**0.1**	**<0.01**
2034	No Action	15.5	0.03	0.03	3.0	0.5	0.2
	Proposed Action	18.5	0.04	0.04	3.6	0.6	0.2
	Net Difference	**3.0**	**<0.01**	**<0.01**	**0.6**	**0.1**	**<0.01**
Source: KB Environmental Sciences, Inc., 2020.							

2.7.3 Climate

CEQ has noted that "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand." Accordingly, it is not useful to attempt to determine the significance of such impacts. There is a considerable amount of ongoing scientific research to improve understanding of global climate change and FAA guidance will evolve as the science matures or if new Federal requirements are established.[15]

As stated in Section 2.7.2 there are no anticipated increases in operational motor vehicle emissions associated with the Proposed Action. However, the Proposed Action would result in increases in GHG emissions associated with construction equipment/vehicles as well as increases in aircraft taxi times. These changes are minor and would not cause or create a reasonably foreseeable impact on global climate.

3. Noise

This section presents the aircraft noise exposure for the existing and future No Action and Proposed Action Alternatives. The noise analysis was prepared to meet the requirements of FAA Order 1050.1F and Order 5050.4B.[16] The following describes the regulatory background, noise analysis methodology, noise model input data, and noise exposure results.

3.1 Regulatory Guidelines and Noise Model

The noise analysis was developed using the FAA's AEDT Version 3c. The AEDT is the required tool to evaluate potential aircraft noise impacts from actions subject to NEPA. The AEDT produces aircraft noise contours that delineate areas of equal day-night average sound level (DNL). The DNL is a 24-hour time-weighted sound level that is expressed in A-weighted decibels (dB). The FAA and other federal agencies use DNL as the primary measure of noise impact because: DNL values correlate well with the results of attitudinal surveys regarding noise; DNL values increase with the duration of noise events; and, DNL values account for an increased sensitivity to noise at night by increasing each noise event that occurs during nighttime hours (i.e., 10:00 pm to 6:59 am) by 10 dB.

The AEDT works by defining a network of grid points at ground level around an airport. The model then selects the shortest distance from each grid point to each flight track and computes the noise exposure generated by each aircraft operation, along each flight track. Corrections are applied for atmospheric acoustical attenuation, acoustical shielding of the aircraft engines by the aircraft itself, and aircraft speed variations. The noise exposure

15 FAA Order 1050.1F Desk Reference Federal Aviation Administration Office of Environment and Energy Version 2 (February 2020).
[16] FAA Order 1050.1F, Environmental Impacts: Policies and Procedures; and FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions.

levels for each aircraft are then summed at each grid location. The cumulative noise exposure levels at all grid points are then used to develop noise exposure contours for selected values (e.g. DNL 65, 70 and 75 dB).

Guidelines regarding the compatibility of land uses within various DNL contour intervals are specified in *Appendix A of 14 Code of Federal Regulations (CFR) Part 150*. As shown in **Table 8** (provided on the next page of this report), the FAA identifies, as a function of DNL values, land uses which are compatible and land uses which are not compatible in an airport environs. The FAA has determined that the all the land uses listed in the table are normally compatible with aircraft noise exposure below the DNL 65 dB contour. When evaluating noise and land use compatibility, attention is therefore focused on uses within the DNL 65 dB contour.

3.2 Existing DNL Contours (2018)

In the development of DNL contours, the AEDT uses both default and airport-specific factors. The default factors include engine noise levels, thrust settings, aircraft arrival and departure flight profiles and aircraft speed. The airport-specific factors include the number of aircraft operations, the type of aircraft, runway use, the assignment of aircraft operations to flight tracks and operational time (day/night) data. This section includes the airport-specific factors used in modeling the existing 2018 DNL contours.

The 2018 annual operations were developed using data in the DIJ Master Plan. The 2018 aircraft operations by category are provided in **Table 9**. As shown, in 2018 there were 15,000 annual operations (an average of approximately 41 operations per day).

Table 9 – 2018 Annual Operations

Air Taxi	General Aviation	Military	Total
500	14,480	20	15,000

Source: DIJ Airport Master Plan, 2019.

For the purposes of preparing DNL contours, operational data were segregated by aircraft type. Aircraft information in the master plan and the FAA's Traffic Flow Management System Count (TFMSC) data for 2018 were used to develop the AEDT aircraft fleet mix. TFMSC data provides information on traffic counts by airport and includes the aircraft types operating at that airport. The TFMSC data for DIJ was reviewed and each aircraft type was assigned the corresponding AEDT aircraft type. As required for use in the AEDT, annual aircraft operations were converted to annual average-day operations.

Table 8 – FAA Land Use Compatibility Guidelines

Land Use	DNL expressed in dB(A)					
	Below 65	65–70	70–75	75–80	80–85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N

Table 8 – FAA Land Use Compatibility Guidelines

Land Use	DNL expressed in dB(A)					
	Below 65	65–70	70–75	75–80	80–85	Over 85
Wholesale and retail—building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Notes: SLUCM = Standard Land Use Coding Manual, Y (Yes) = Land Use and related structures compatible without restrictions, N (No) = Land Use and related structures are not compatible and should be prohibited, and NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35 = Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.
(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems. (2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low. (3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low. (4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low. (5) Land use compatible provided special sound reinforcement systems are installed. (6) Residential buildings require an NLR of 25. (7) Residential buildings require an NLR of 30. (8) Residential buildings not permitted.
Source: 14 CFR Part 150.

Aircraft day/night percentages were determined through a sample of published Instrument Flight Rule flight plan data. The data showed that approximately 97 percent of the operations occurred during the daytime (7:00 am – 9:59 pm). For modeling purposes, the local general aviation and all military operations were also modeled with 97 percent occurring during the daytime. The 2018 average-day modeled aircraft fleet of itinerant and local[17] operations are provided in **Table 10**.

[17] An itinerant operation is defined as an aircraft departure where the aircraft leaves the airport vicinity and lands at another airport, or an aircraft landing where the aircraft arrives from another airport. Local operations are primarily aircraft touch-and-go training operations or those that remain within the local airspace for the duration of the flight.

Table 10 – 2018 Modeled Average-Day Operations

Aircraft Category	Aircraft Type(s)	AEDT ANP	Day	Night	Total
Itinerant					
General Aviation Jet	Cessna 500 Citation I	CNA500	0.704	0.022	0.726
	Bombardier Challenger 600	CL600	0.547	0.017	0.564
	Cessna 750 Citation X	CNA750	0.547	0.017	0.564
	Cessna Citation 510	CNA510	0.510	0.016	0.526
	Cessna 550 Citation II	CNA55B	0.391	0.012	0.403
	Bombardier Learjet 35	LEAR35	0.274	0.008	0.282
	Cessna 560 Citation XLS	CNA560XL	0.197	0.006	0.203
	Dassault Falcon 900-EX	FAL900EX	0.157	0.005	0.162
	Cessna 560 Citation V	CNA560U	0.157	0.005	0.162
	Gulfstream G400	GIV	0.157	0.005	0.162
	Cessna 525 CitationJet	CNA525C	0.077	0.002	0.079
	Cessna 650 Citation III	CIT3	0.077	0.002	0.079
	Israel IAI-1125 Astra	IA1125	0.040	0.001	0.041
	Gulfstream G500	GV	0.040	0.001	0.041
	Bombardier Global Express	BD-700-1A10	0.040	0.001	0.041
General Aviation Turboprop	Cessna 208 Caravan	CNA208	0.686	0.021	0.707
	DeHavilland DHC-6-300	DHC6	0.590	0.018	0.608
	Cessna 441 Conquest II	CNA441	0.319	0.010	0.329
General Aviation Single Engine	Piper PA46 Meridian	GASEPV	4.087	0.126	4.214
	Cirrus SR22	COMSEP	0.444	0.014	0.458
	Cessna 172 Skyhawk	CNA172	0.247	0.008	0.255
	Aero Commander	GASEPF	0.149	0.005	0.153
General Aviation Multi-Engine	Raytheon Beech Baron 58	BEC58P	2.591	0.080	2.671
Helicopter	Bell 206L-4T Long Ranger	B206L	2.790	0.086	2.877
Sport	Robin Alpha Sport	SPORT	1.196	0.037	1.233
Military / Warbirds	Rockwell T-2 Buckeye	T-2C	0.035	0.001	0.036
	MD A-4 Skyhawk	A4C	0.035	0.001	0.036
		Total Itinerant	**17.083**	**0.528**	**17.611**
Local					
General Aviation Single Engine	Piper PA46 Meridian	GASEPV	5.695	0.176	5.871
	Cirrus SR22	COMSEP	5.695	0.176	5.871
	Cessna 172 Skyhawk	CNA172	5.695	0.176	5.871
	Aero Commander	GASEPF	5.695	0.176	5.871
		Total Local	**22.780**	**0.705**	**23.485**
		All	**39.863**	**1.233**	**41.096**

ANP = Aircraft Noise and Performance
Source: DIJ Airport Master Plan, 2019 and KB Environmental Sciences, Inc., 2020.

Runway use refers to the frequency with which aircraft utilize each runway end for departures and arrivals. The more often a runway is used, the more noise is generated in areas located off each end of that runway. For modeling purposes, it was estimated that in 2018 64 percent of operations occurred on Runway 4 and 36 percent on Runway 22.

The AEDT uses airport-specific ground tracks and vertical flight profiles to compute three-dimensional flight paths for each modeled aircraft operation. The "default" AEDT vertical profiles, which consist of altitude, speed, and thrust settings, are compiled from data provided by aircraft manufacturers. Aircraft flight tracks utilized by itinerant (arrivals and departures) were modeled straight-in/straight-out in the immediate vicinity of the runway ends. The local touch-and-go operations were modeled following a standard left-traffic pattern from Runway 4 and a right-traffic pattern from Runway 22.

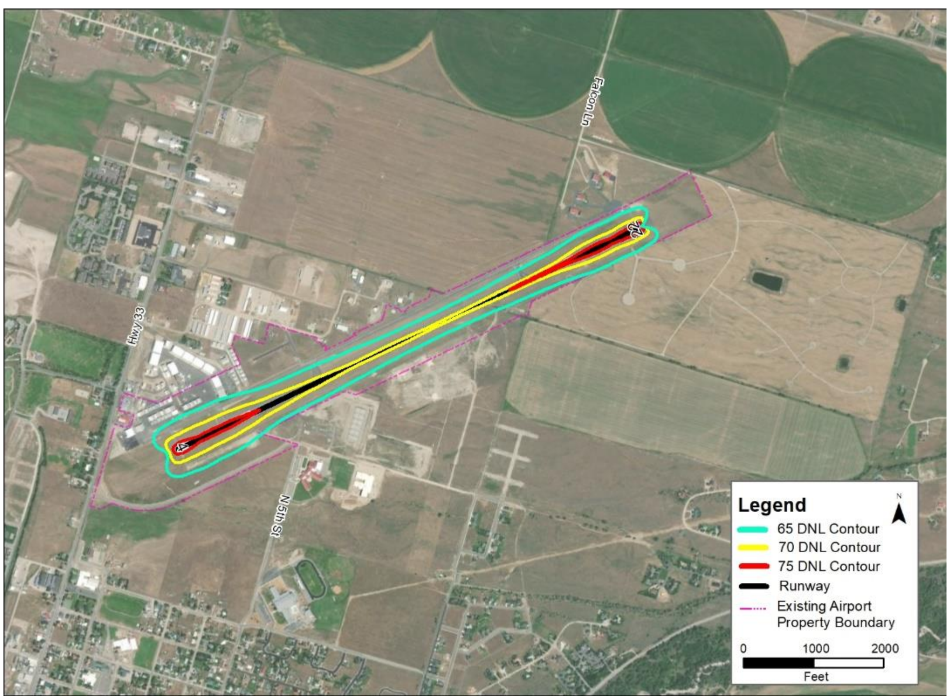
The 2018 DNL 65-75 dB contours are depicted on **Figure 1**. **Table 11** provides the area that is encompassed within each DNL contour range. As shown, the total area within the DNL 65 dB contour is approximately 88 acres. The DNL 65 dB contour primarily remains within the limits of the existing airport property boundary and there are no noise sensitive land uses or other noise sensitive structures within the contour.

Table 11 – 2018 DNL Contour Areas

DNL (dB)	Area (Acres)
65 to 70	59
70 to 75	23
75 and greater	6
Total	**88**

Source: KB Environmental Sciences, Inc., 2020.

Figure 1: 2018 DNL 65-75 dB Contours



Source: KB Environmental Sciences, Inc., 2020.

3.3 Future Alternatives Noise Exposure

The Proposed Action involves a shift of the runway approximately 1,950 feet to the northeast. Per FAA Order 1050.1F, *"a significant noise impact would occur if the action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is [already] exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe.*" Noise sensitive areas generally include residential neighborhoods; educational, health, and religious facilities; and cultural and historic sites.

The methodology for assessing noise exposure included preparing DNL contours for the No Action and Proposed Action alternatives for the years 2029, which is the projected first full year that the airport will operate with the shifted runway and the year 2034, 5-years beyond. The contours were developed to assess if a significant noise impact would occur by comparing the noise exposure levels of the future No Action and Proposed Action alternatives.

The 2029 and 2034 aircraft operations were obtained from the DIJ Master Plan. These data, by aircraft category, are provided in **Table 12**. As shown, the 2029 annual operations are forecast to total 19,144, an average of approximately 52 operations per day and the 2034 annual operations are forecast to total 21,446, an average of 59 operations per day.

Table 12 – Forecast Annual Operations

Year	Air Taxi	General Aviation	Military	Total
2029	656	18,468	20	19,144
2034	744	20,682	20	21,446

Source: DIJ Airport Master Plan, 2019.

3.3.1 Noise Exposure - 2029

The 2029 aircraft fleet mix was derived by multiplying the percentages of the aircraft types that occurred in 2018 by the operations forecast to occur in 2029. The resultant 2029 average-day aircraft fleet for itinerant and local operations are provided in **Table 13**. The runway use and time of day percentages modeled for the 2029 condition were assumed to be the same as the 2018 condition.

The 2029 No Action DNL 65-75 dB contours are depicted on **Figure 2**. **Table 14** provides the area that is encompassed within each DNL contour range. As shown, the total area within the DNL 65 dB contour is approximately 100 acres. The DNL 65 dB contour primarily remains within the limits of the existing airport property boundary and there are no noise sensitive land uses or other noise sensitive structures within the contour.

Table 14 – 2029 No Action DNL Contour Areas

DNL (dB)	Area (Acres)
65 to 70	64
70 to 75	28
75 and greater	8
Total	**100**

Source: KB Environmental Sciences, Inc., 2020.

Table 13 – 2029 Modeled Average-Day Operations

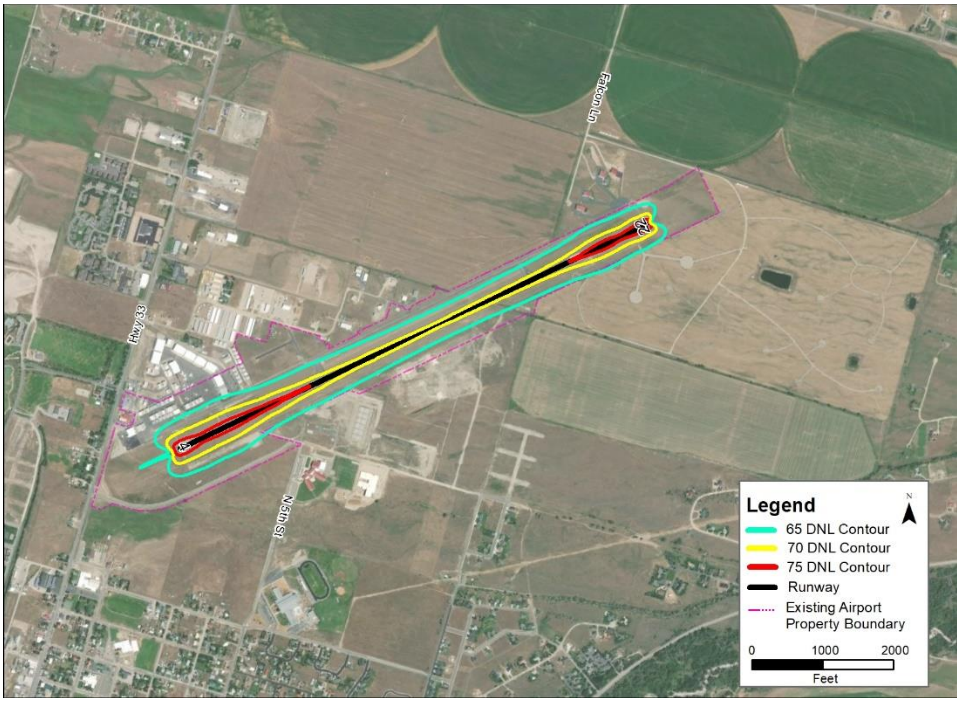
Aircraft Category	Aircraft Type(s)	AEDT ANP	Day	Night	Total
Itinerant					
General Aviation Jet	Cessna 500 Citation I	CNA500	1.092	0.034	1.126
	Bombardier Challenger 600	CL600	0.848	0.026	0.874
	Cessna 750 Citation X	CNA750	0.845	0.026	0.871
	Cessna Citation 510	CNA510	0.789	0.024	0.814
	Cessna 550 Citation II	CNA55B	0.606	0.019	0.625
	Bombardier Learjet 35	LEAR35	0.425	0.013	0.438
	Cessna 560 Citation XLS	CNA560XL	0.303	0.009	0.312
	Dassault Falcon 900-EX	FAL900EX	0.242	0.007	0.249
	Cessna 560 Citation V	CNA560U	0.242	0.007	0.249

Table 13 – 2029 Modeled Average-Day Operations

Aircraft Category	Aircraft Type(s)	AEDT ANP	Day	Night	Total
	Gulfstream G400	GIV	0.242	0.007	0.249
	Cessna 525 CitationJet	CNA525C	0.122	0.004	0.126
	Cessna 650 Citation III	CIT3	0.122	0.004	0.126
	Israel IAI-1125 Astra	IA1125	0.061	0.002	0.063
	Gulfstream G500	GV	0.061	0.002	0.063
	Bombardier Global Express	BD-700-1A10	0.061	0.002	0.063
General Aviation Turboprop	Cessna 208 Caravan	CNA208	1.095	0.034	1.129
	DeHavilland DHC-6-300	DHC6	0.941	0.029	0.970
	Cessna 441 Conquest II	CNA441	0.508	0.016	0.523
General Aviation Single Engine	Piper PA46 Meridian	GASEPV	2.862	0.089	2.951
	Cirrus SR22	COMSEP	0.311	0.010	0.321
	Cessna 172 Skyhawk	CNA172	0.173	0.005	0.178
	Aero Commander	GASEPF	0.104	0.003	0.107
General Aviation Multi-Engine	Raytheon Beech Baron 58	BEC58P	2.798	0.087	2.885
Helicopter	Bell 206L-4T Long Ranger	B206L	4.640	0.144	4.784
Sport	Robin Alpha Sport	SPORT	2.320	0.072	2.392
Military / Warbirds	Rockwell T-2 Buckeye	T-2C	0.053	0.002	0.055
	MD A-4 Skyhawk	A4C	0.053	0.002	0.055
		Total Itinerant	**21.919**	**0.678**	**22.597**
Local					
General Aviation Single Engine	Piper PA46 Meridian	GASEPV	7.239	0.224	7.463
	Cirrus SR22	COMSEP	7.239	0.224	7.463
	Cessna 172 Skyhawk	CNA172	7.239	0.224	7.463
	Aero Commander	GASEPF	7.239	0.224	7.463
		Total Local	**28.956**	**0.896**	**29.852**
		All	**50.876**	**1.573**	**52.449**

ANP = Aircraft Noise and Performance
Source: DIJ Airport Master Plan, 2019 and KB Environmental Sciences, Inc., 2020.

Figure 2: 2029 No Action DNL 65-75 dB Contours



Source: KB Environmental Sciences, Inc., 2020.

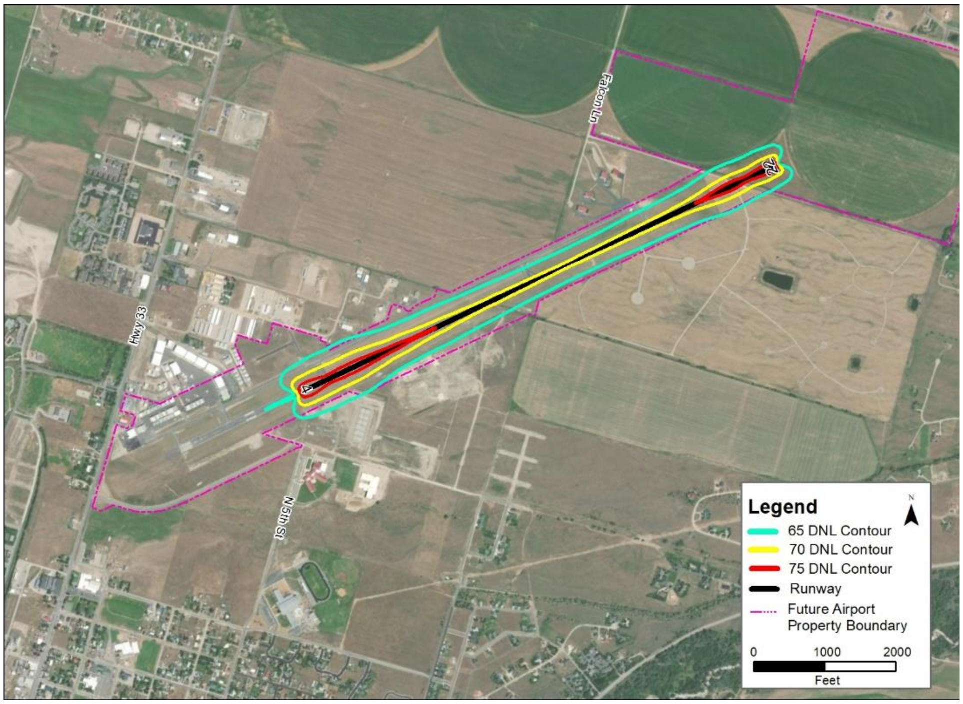
As previously stated, the Proposed Action involves a shift of the runway to the northeast. With the exception of this improvement, the analysis modeled the same level of aircraft operations, fleet mix, flight tracks, time of day and runway use modeled for the 2029 No Action alternative. The 2029 Proposed Action DNL 65-75 dB contours are depicted on **Figure 3**. **Table 15** identifies the areas within the DNL contour ranges. As shown, the total area within the DNL 65 dB contour is approximately 100 acres. The DNL 65 dB contour primarily remains within the limits of the future airport property boundary and there are no noise sensitive land uses or other noise sensitive structures within the contour

Table 15 – 2029 Proposed Action DNL Contour Areas

DNL (dB)	Area (Acres)
65 to 70	64
70 to 75	28
75 and greater	8
Total	**100**

Source: KB Environmental Sciences, Inc., 2020.

Figure 3: 2029 Proposed Action DNL 65-75 dB Contours



Source: KB Environmental Sciences, Inc., 2020.

3.3.2 Noise Exposure - 2034

The 2034 aircraft fleet mix was derived by multiplying the percentages of the aircraft types that occurred in 2018 by the operations forecast to occur in 2034. The resultant 2034 average-day aircraft fleet for itinerant and local operations are provided in **Table 16**. The runway use and time of day percentages modeled for the 2034 condition were the same as the 2029 condition.

The 2034 No Action DNL 65-75 dB contours are depicted on **Figure 4**. **Table 17** provides the area that is encompassed within each DNL contour range. As shown, the total area within the DNL 65 dB contour is approximately 108 acres. The DNL 65 dB contour primarily remains within the limits of the existing airport property boundary and there are no noise sensitive land uses or other noise sensitive structures within the contour.

Table 17 – 2034 No Action DNL Contour Areas

DNL (dB)	Area (Acres)
65 to 70	68
70 to 75	31
75 and greater	9
Total	**108**

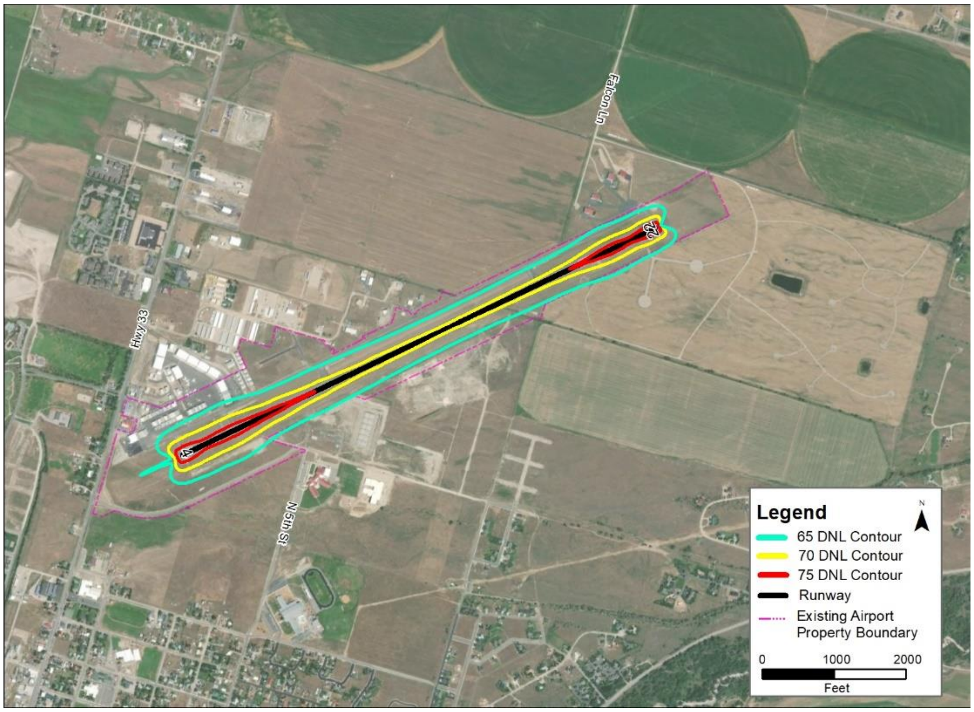
Source: KB Environmental Sciences, Inc., 2020.

Table 16 – 2034 Modeled Average-Day Operations

Aircraft Category	Aircraft Type(s)	AEDT ANP	Day	Night	Total
Itinerant					
General Aviation Jet	Cessna 500 Citation I	CNA500	1.276	0.039	1.315
	Bombardier Challenger 600	CL600	0.991	0.031	1.022
	Cessna 750 Citation X	CNA750	0.986	0.030	1.016
	Cessna Citation 510	CNA510	0.922	0.029	0.951
	Cessna 550 Citation II	CNA55B	0.710	0.022	0.732
	Bombardier Learjet 35	LEAR35	0.497	0.015	0.512
	Cessna 560 Citation XLS	CNA560XL	0.353	0.011	0.364
	Dassault Falcon 900-EX	FAL900EX	0.284	0.009	0.293
	Cessna 560 Citation V	CNA560U	0.284	0.009	0.293
	Gulfstream G400	GIV	0.284	0.009	0.293
	Cessna 525 CitationJet	CNA525C	0.141	0.004	0.145
	Cessna 650 Citation III	CIT3	0.141	0.004	0.145
	Israel IAI-1125 Astra	IA1125	0.072	0.002	0.074
	Gulfstream G500	GV	0.072	0.002	0.074
	Bombardier Global Express	BD-700-1A10	0.072	0.002	0.074
General Aviation Turboprop	Cessna 208 Caravan	CNA208	1.225	0.038	1.263
	DeHavilland DHC-6-300	DHC6	1.055	0.033	1.088
	Cessna 441 Conquest II	CNA441	0.569	0.018	0.586
General Aviation Single Engine	Piper PA46 Meridian	GASEPV	2.588	0.080	2.668
	Cirrus SR22	COMSEP	0.282	0.009	0.290
	Cessna 172 Skyhawk	CNA172	0.157	0.005	0.162
	Aero Commander	GASEPF	0.093	0.003	0.096
General Aviation Multi-Engine	Raytheon Beech Baron 58	BEC58P	3.136	0.097	3.233
Helicopter	Bell 206L-4T Long Ranger	B206L	5.501	0.170	5.671
Sport	Robin Alpha Sport	SPORT	2.751	0.085	2.836
Military / Warbirds	Rockwell T-2 Buckeye	T-2C	0.061	0.002	0.063
	MD A-4 Skyhawk	A4C	0.061	0.002	0.063
		Total Itinerant	**24.564**	**0.760**	**25.323**
Local					
General Aviation Single Engine	Piper PA46 Meridian	GASEPV	8.108	0.251	8.359
	Cirrus SR22	COMSEP	8.108	0.251	8.359
	Cessna 172 Skyhawk	CNA172	8.108	0.251	8.359
	Aero Commander	GASEPF	8.105	0.251	8.356
		Total Local	**32.430**	**1.003**	**33.433**
		All	**56.993**	**1.763**	**58.756**

ANP = Aircraft Noise and Performance
Source: DIJ Airport Master Plan, 2019 and KB Environmental Sciences, Inc., 2020.

Figure 4: 2034 No Action DNL 65-75 dB Contours



Source: KB Environmental Sciences, Inc., 2020.

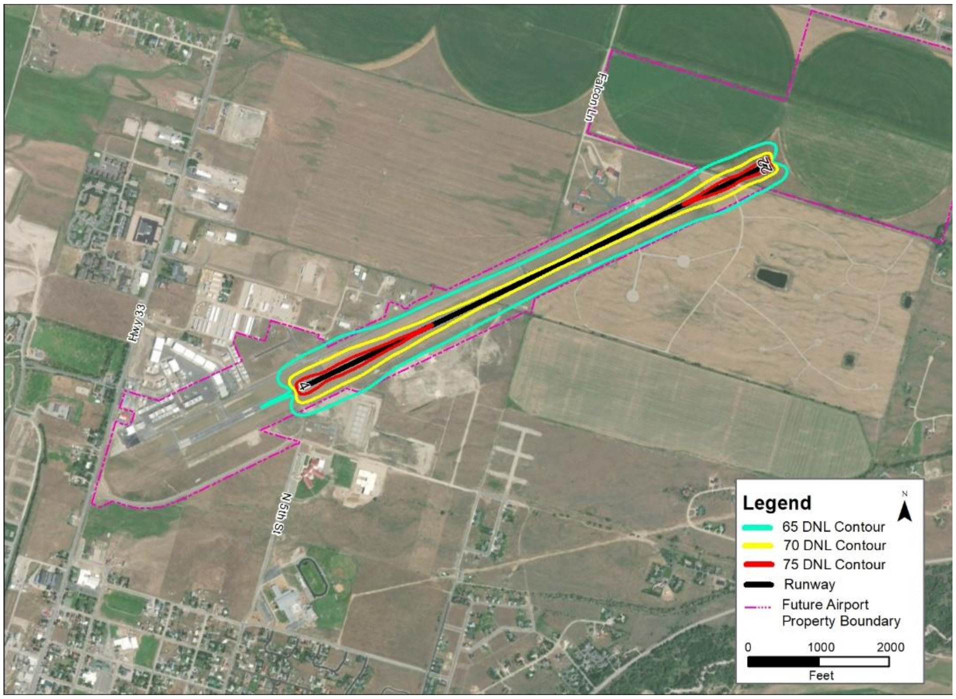
The 2034 Proposed Action aircraft operations, fleet mix, flight tracks, time of day and runway use modeled were the same as the 2034 No Action alternative. The 2034 Proposed Action DNL 65-75 dB contours are depicted on **Figure 5**. **Table 18** identifies the areas within the DNL contour ranges. As shown, the total area within the DNL 65 dB contour is approximately 108 acres. The DNL 65 dB contour primarily remains within the limits of the future airport property boundary and there are no noise sensitive land uses or other noise sensitive structures within the contour.

Table 18 – 2034 Proposed Action DNL Contour Areas

DNL (dB)	Area (Acres)
65 to 70	68
70 to 75	31
75 and greater	9
Total	**108**

Source: KB Environmental Sciences, Inc., 2020.

Figure 5: 2034 Proposed Action DNL 65-75 dB Contours



Source: KB Environmental Sciences, Inc., 2020.

3.4 Mitigation

Because no noise sensitive areas would experience a DNL 1.5 dB increase at or above DNL 65 dB in 2029 or 2034 as a result of the Proposed Action, no aircraft noise-related mitigation is required for the proposed improvements.