5 Environmental Consequences

This chapter discusses the potential environmental impacts that could result from implementing the Proposed Action and the No Action Alternative. Specifically, this EA considers effects on the environmental resource categories identified in FAA Order 1050.1F. Both the Proposed Action and the No Action Alternative were evaluated under forecasted 2020 conditions, which is the first year the Proposed Action could potentially be implemented, and under forecasted 2025 conditions. This evaluation considers the direct, indirect, and cumulative effects associated with the Proposed Action and No Action Alternative, as required under FAA Order 1050.1F.

Potential environmental impacts are identified for the environmental resource categories described in Section 4.3. Neither the Proposed Action nor the No Action Alternative would involve land acquisition; physical changes to the environment resulting from ground disturbance or construction activities; changes in patterns of population movement or growth, increases in public service demands, or business and economic activity; or generation, disturbance, transportation, or treatment of hazardous materials. Therefore, neither alternative is expected to result in impacts to certain environmental resource categories (please see Section 4.2 for a list of excluded categories). The excluded environmental resource categories are not further discussed in this chapter.

Table 5-1 identifies the environmental impact categories that the Proposed Action could potentially affect, the thresholds of significance used to determine the potential for impacts, and a side-by-side comparative summary of the potential for environmental impacts resulting from implementing the Proposed Action under 2020 and 2025 forecast conditions.

Table 5-1 Summary of Potential Environmental Impacts

Environmental Impact Category	Threshold of Significance/Factors to Consider	Significant Impact?	
		2020	2025
Noise and Noise Compatible Land Use	A significant noise impact would occur if the Proposed Action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65dB level due to a DNL 1.5dB or greater increase, when compared to the no action alternative for the same timeframe.	No	No
Department of Transportation Act, Section 4(f) Resources	A significant impact would occur if the Proposed Action involves more than a minimal physical use of a Section 4(f) resource or constitutes a "constructive use" based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource. Resources that are protected by Section 4(f) are publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance; and publicly or privately-owned land from a historic site of national, state, or local significance. Substantial impairment occurs when the activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished.	No	No
Historical, Architectural, Archeological, and Cultural Resources	The FAA has not established a significance threshold for Historical, Architectural, Archeological, and Cultural Resources	No	No

Table 5-1 Summary of Potential Environmental Impacts

Environmental Impact Category	Threshold of Significance/Factors to Consider	Significant Impact? 2020	Significant Impact? 2025
Wildlife (Avian and Bat Species)	A significant impact to federally-listed threatened and endangered species would occur when the United States Fish and Wildlife Service (FWS) or National Marine Fisheries Service (NMFS) determines that the Proposed Action would be likely to jeopardize the continued existence of the species in question, or would result in the destruction or adverse modification of Federally-designated critical habitat. Lesser impacts including impacts on non-listed species could also constitute a significant impact based on consideration factors such as long-term or permanent loss of unlisted wildlife species and adverse impacts to special status species or their habitats. The FAA has not established a significance threshold for non-listed species.	No	No
Environmental Justice	The FAA has not established a significance threshold for Environmental Justice. However, a significant factor to consider to determine potential significant impact is if the action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population, i.e., a low-income or minority population due to significant impacts in other environmental impact categories, and/or causes impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines are unique and significant to the environmental justice population	No	No
Energy Supply (Aircraft Fuel)	The FAA has not established a significance threshold for Energy Supply. However, a significant factor to consider is if the action would have the potential to cause demand to exceed available or future (2025) supplies of these resources.	No	No
Air Quality	A significant impact would occur if the Proposed Action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the Environmental Protection Agency under the Clean Air Act, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.	No	No
Climate	The FAA has not established a significance threshold for Climate and has not identified specific factors to consider in making a significance determination.	No	No
Visual Effects	The FAA has not established a significance threshold for Visual Resources / Visual Character. Significant factors to consider include the potential effect an action has on the nature of the visual character of the area, potential to contrast with the visual resources and/or visual character in the study area, and/or potential to block or obstruct the views of visual resources	No	No

Source: FAA Order 1050.1F, Exhibit 4-1, July 2015.
Prepared By: ATAC Corporation, April 2020.

The following sections describe the impact findings for each environmental resource category, followed by a discussion of potential cumulative impacts. In summary, no significant impacts to any environmental resource category have been identified.

5.1 Noise and Compatible Land Use

This section discusses the analysis of aircraft noise exposure under the Proposed Action and the No Action Alternative, under both 2020 and 2025 forecast conditions. This discussion includes identifying the differences in noise exposure between the Proposed Action and the No Action Alternative. This comparison is used to determine if implementing the Proposed Action would result in significant noise impacts. Additional information on noise metrics and the basics of noise can be found in **Appendix E**. Detailed information on the noise analysis prepared for the LAS Metroplex Project is included in the **Appendix I**.

5.1.1 Summary of Impacts

Aircraft noise exposure was modeled for both the Proposed Action and the No Action Alternative under 2020 and 2025 forecast conditions. The noise analysis demonstrates that implementing the Proposed Action would not result in a day-night average sound level (DNL) increase of 1.5 dBA or higher in noise-sensitive areas exposed to DNL 65 dB or higher. Therefore, neither the Proposed Action nor No Action Alternative would result in a significant noise impact.

5.1.2 Methodology

The noise analysis evaluated noise exposure to communities within the General Study Area from aircraft forecasted to be operating under Instrument Flight Rules (IFR)-filed flight plans, at altitudes from ground level up to 10,000 feet above ground level (AGL). IFR-filed aircraft activity was forecasted for the years 2020 and 2025 and used to model conditions under both the Proposed Action and the No Action Alternative. Noise modeling was conducted using Aviation Environmental Design Tool version 2d (AEDT 2d), the FAA-required noise model for aviation projects including air traffic changes over large areas and altitudes over 3,000 feet AGL.[53] Noise was modelled from the ground level up to and including 18,000 feet AGL for the General Study Area and the 18K Supplemental Boundary Area due to the presence of national parks and/or wildlife refuges.[54]

If the FAA approves the Proposed Action, the agency expects to begin implementation in 2020. Therefore, aircraft noise modeling was conducted for 2020 and five years later (2025), as required by FAA Order 1050.1F. Future year noise exposure levels modeled for the Proposed Action and the No Action Alternative were compared to determine whether there is a potential for noise impacts. While the overall number and type of aircraft operations will increase between 2020 and 2025, the number and type of aircraft operations are the same under both the Proposed Action and No Action Alternative in 2020 and 2025. The Proposed Action does not include developing or constructing facilities, such as runways or terminal expansions, that would be necessary to accommodate an increase in aviation activity; therefore, no additional growth in operations associated with the Proposed Action is anticipated. The noise analysis reflects the change in noise exposure resulting from the proposed changes in aircraft routes (i.e., flight tracks) under the Proposed Action compared to the No Action Alternative.

53 FAA 1050.1F *Desk Reference*, *Noise and Noise-Compatible Land Use*, Sec. 11.1.3, July 2015.

54 FAA 1050.1F *Desk Reference*, *Noise and Noise-Compatible Land Use*, App. B-1.3, July 2015.

Detailed information on IFR-filed aircraft operations within the General Study Area was assembled for input into AEDT 2d, including the following data:

Average Annual Day IFR-Filed Aircraft Flight Schedules: The IFR-filed aircraft flight schedules identify arrival and departure times, aircraft types, and origin/destination information for an average annual day (AAD) in 2020 and 2025. The AAD represents all the aircraft operations for every day in a study year divided by 365, the number of days in a year. The AAD does not reflect a particular day, but is meant to represent a typical day over a period of a year. The forecast was based on the FAA's 2019 Terminal Area Forecast (TAF),[55] modified for 2020 and 2025 with additional details using previously identified arrival/departure times, aircraft types, and origin/destination information. More detail related to the development of the forecasts is provided in **Appendix H**.

Weather: The AEDT 2d model includes data for multiple meteorological parameters, including temperature, pressure, and humidity. Weather conditions for all Study Airports were defined and used in the noise study. Further discussion on the weather data employed in the AEDT 2d model can be found in **Appendix I**.

Flight Tracks: The flight tracks used in noise modeling were based on radar data collected for the existing conditions (2017) noise analysis and information provided by FAA Air Traffic Control (ATC) personnel. Aircraft routings under both the No Action Alternative and Proposed Action are depicted in **Exhibits 3-7** through **3-10** in Chapter 3, *Alternatives*. For the Proposed Action, flight tracks were developed from the aircraft procedures created by the Las Vegas Metroplex Design & Implementation (D&I) Team using the Terminal Area Route Generation, Evaluation, Traffic and Simulation (TARGETS) program. The majority of the No Action Alternative modeled flight tracks are based on the existing conditions noise analysis. The remaining No Action Alternative flight tracks for amended or new procedures were modeled based on input from the air traffic control experts who developed the procedures. Illustrations depicting Existing Conditions radar tracks and Proposed Action procedure designs were developed and shared with the D&I team as part of the consultation process. The consultations were conducted to seek out key model input assumptions such as frequency of Proposed Action procedure usage and air traffic control techniques such as vectoring. The assumptions were then used for refining model track locations, altitude profiles, and utilization.

TARGETS flyability lines, or the lines indicating the actual 3D path of different categories of aircraft ideally flying the procedure for the Proposed Action procedures served as the center of the 1 nautical mile and 0.3 nautical mile containment area for RNAVs and RNPs, respectively. The containment area is generally where dispersed tracks are contained, but during the D&I consultation process, air traffic control experts could indicate the need for vectors off of the RNAV with a rejoin of the RNAV at a later point. For those identified cases AEDT 2d model tracks were developed to account for that type of dispersion.

Runway Use: Runway use percentages were identified for all runways at the Study Airports. Forecasted aircraft operations were assigned to particular runways representing operating conditions at the Study Airports under Proposed Action and No Action Alternative conditions. Runway use patterns did not change under the Proposed Action Alternative at the Study Airports compared to the No Action Alternative.

55 U.S. Department of Transportation, Federal Aviation Administration, Terminal Area Forecast, 2012 (https://aspm.faa.gov/main/taf.asp; accessed September 2018).

More detail related to the development of the AEDT 2d model input files is provided in **Appendix I.**

As discussed in Section 4.3.1.1, the AEDT 2d model was used to compute DNL values for 2020 and 2025 Proposed Action and No Action Alternative conditions at multiple sets of data points throughout the General Study Area:

- 20,070 2010 Census block centroids
- 94,693 uniform grid points at 0.5-nautical mile (NM) intervals on a uniform grid covering the General Study Area, which were also used to calculate DNL values at potential Department of Transportation Act (DOT), Section 4(f) resources and historic sites
- 58,076 unique points representing Section 4(f) resources, including 143 National Register of Historic Places (NRHP) listed historic sites
- Other unique points evaluated include 108 noise sensitive uses in areas around the Study Airports exposed to noise levels of DNL 65 dB and higher

As discussed in Section 4.3.1.1, DNL is the FAA's primary noise metric. **Table 5-2** provides the criteria used to assess the changes in aircraft noise exposure attributable to the Proposed Action compared with the No Action Alternative. FAA Order 1050.1F defines a significant impact as an increase of DNL 1.5 dB at noise-sensitive land use locations (e.g., residences, schools, etc.) exposed to aircraft noise of DNL 65 dB or higher under the Proposed Action. For example, an increase from 63.5 dB to 65 dB is considered a significant impact.

FAA Order 1050.1F also recommends that when there are DNL increases of 1.5 dB or more at noise-sensitive locations in areas exposed to aircraft noise of DNL 65 dB and higher, DNL increases of 3 dB or more in areas exposed to aircraft noise between DNL 60 dB and 65 dB should also be evaluated and disclosed. It is important to note that DNL increases of 3 dB in areas exposed to aircraft noise below DNL 65 dB are not considered "significant impacts" but are to be considered in the environmental evaluation of a proposed project.

FAA Order 1050.1F also stipulates that changes in exposure of DNL 5 dB or greater in areas exposed to aircraft noise between DNL 45 dB and 60 dB should be considered for airspace actions such as changes to air traffic routes. This threshold was established in 1990, following issuance of an FAA noise screening procedure to evaluate whether certain airspace actions above 3,000 feet AGL might increase DNL levels by 5 dB or more. The FAA prepared this noise-screening procedure because experience indicated that DNL increases 5 dB or more at cumulative levels well below DNL 65 dB could be disturbing to people and become a source of public concern. As shown in **Table 5-2**, a 3 dB increase in areas exposed to DNL 60 to 65 dB and a 5 dB increase in areas exposed to DNL 45 to 60 dB are considered reportable noise increases.

Table 5-2 Criteria for Determining Impact of Changes in Aircraft Noise

DNL Noise Exposure Level	Increase in DNL with Proposed Action	Aircraft Noise Exposure Change Consideration
DNL 65 and higher	DNL 1.5 dB or more 1/	Exceeds Threshold of Significance
DNL 60 to 65	DNL 3.0 dB or more 2/	Reportable Noise Increase (Considered When Evaluating Air Traffic Actions)
DNL 45 to 60	DNL 5.0 dB or more 3/	Reportable Noise Increase (Information Disclosed When Evaluating Air Traffic Actions)

Notes:
1/ Source FAA 1050.1F Desk Reference, Pg. 11-9; Title 14 C.F.R. Part 150.21 (2) (d); and Federal Interagency Committee on Noise, Federal Agency Review of Selected Airport Noise Issues, August 1992.
2/ Source FAA 1050.1F Desk Reference, Pg. 11-9; and Federal Interagency Committee on Noise, Federal Agency Review of Selected Airport Noise Issues, August 1992.
3/ Source FAA, 1050.1F Desk Reference, Pg. 11-9.

Source: FAA 1050.1F *Desk Reference*, Ch. 11, *Noise and Noise-Compatible Land Use*, July 2015.
Prepared by: ATAC Corporation, October 2019

5.1.3 Potential Impacts – 2020 and 2025

Table 5-3 summarizes the results of the noise analysis for 2020 and 2025 conditions. The results for both years indicate that, when compared to the No Action Alternative, the Proposed Action would not result in a DNL 1.5 dB or higher increase in noise-sensitive areas exposed to DNL 65 dB or higher. Furthermore, while an area of the GSA would be subject to a reportable noise increase, as depicted in **Exhibit 5-1** and **5-2**, no census block centroids would experience a reportable noise increase in areas exposed to DNL between 60 dB and 65 dB or between 45 dB and 60 dB. These results indicate the Proposed Action would not result in a significant noise exposure impact on population exposed to DNL 65 dB or higher levels under the Proposed Action or produce reportable noise increases in populations exposed to DNL 45 dB to 65 dB.

The reportable noise increase south-southwest of LAS can be attributed to aircraft operating on the BOACH8 departure procedure in the 2020 No Action Alternative Scenario shifting to RADYR1 in the 2020 Proposed Action Alternative. The grid points in Exhibit 5-1 were bounded by a ½ NM buffer to create an Area of Potential Effect (APE). The APE includes portions of US Interstate 15, County Road 161 (Goodsprings Road), and an aerobatic box (used by aircraft operating at the Jean Airport). The APE is adjacent to the Jean Airport, a US Postal facility, a casino hotel complex, a state correctional facility, and a gas station/convenience/fast food complex.

Table 5-3 Change in Potential Population Exposed to Aircraft Noise – 2020 and 2025

DNL Noise Exposure Level Under the Proposed Action	Increase in DNL with the Proposed Action	Population Exposed to Noise that Exceeds the Threshold	
		No Action Alternative	Proposed Action
DNL 65 and higher	DNL 1.5 dB or greater	0	0
DNL 60 to 65	DNL 3.0 dB or greater	0	0
DNL 45 to 60	DNL 5.0 dB or greater	0	0

Sources: U.S. Census Bureau, 2010 Census (population centroid data), accessed March 2017; ATAC Corporation, April 2020 (AEDT 2d modeling results).
Prepared by: ATAC Corporation, April 2020.

Under the No Action Alternative, no changes to air traffic routes in the Las Vegas Metroplex would occur in 2020 and 2025, and no effects related to changes in aircraft noise exposure would be anticipated.

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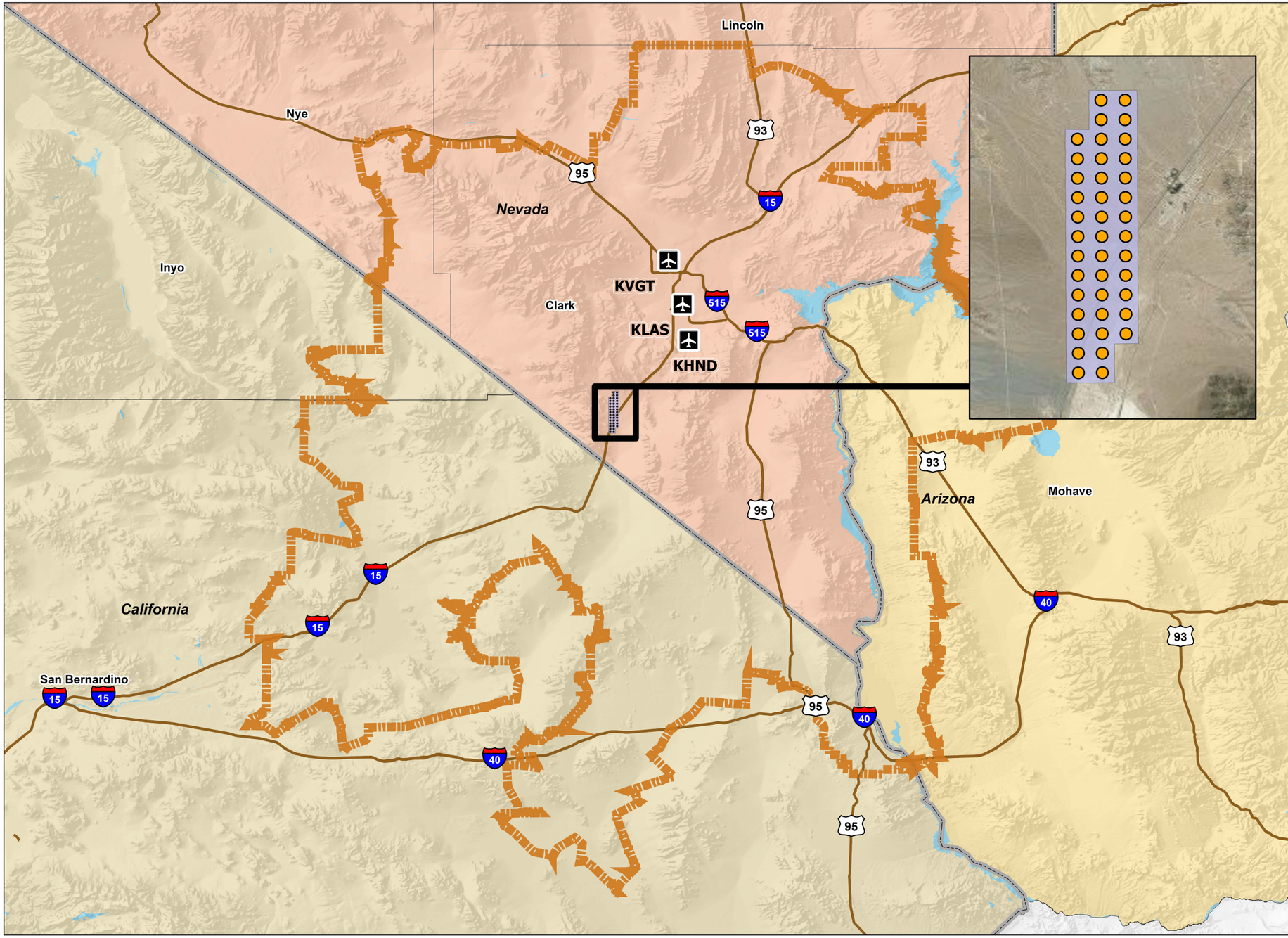

LEGEND

- Evenly-Spaced Grid Centroid Exposed to a DNL 45 to 60 dB with a DNL 5 dB Increase
- Area of Potential Effect
- General Study Area Boundary
- Study Airports
- US and Interstate Highways
- State Boundaries
- Water

General Study Area

- Arizona Counties
- California Counties
- Nevada Counties

Notes:

KHND Henderson Executive Airport
KLAS Mc Carran International Airport
KLSV Nellis Air Force Base
KVGT North Las Vegas Airport

Coordinate System: GCS WGS 1984
Datum: WGS 1984

Scale: 1:1,392,546

0 5 10 20 Miles

N

Sources: Road Network File, U.S. Census Bureau, 2017 (2017 TIGER/Line Shapefiles (machine-readable data files), County Boundary File, US Census Bureau, (2017 TIGER/Line Shapefiles (machine-readable data files); World Imagery, Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.Airports file, Federal Aviation Administration, 2018 Coded Instrument Flight Procedures (CIFP). Shaded Relief, 2018. ATAC Corporation, 2018, (2018 General Study Area boundary).
Prepared by: ATAC Corporation, November 2019.

Exhibit 5-1

Reportable Noise Increases in the General Study Area - 2020

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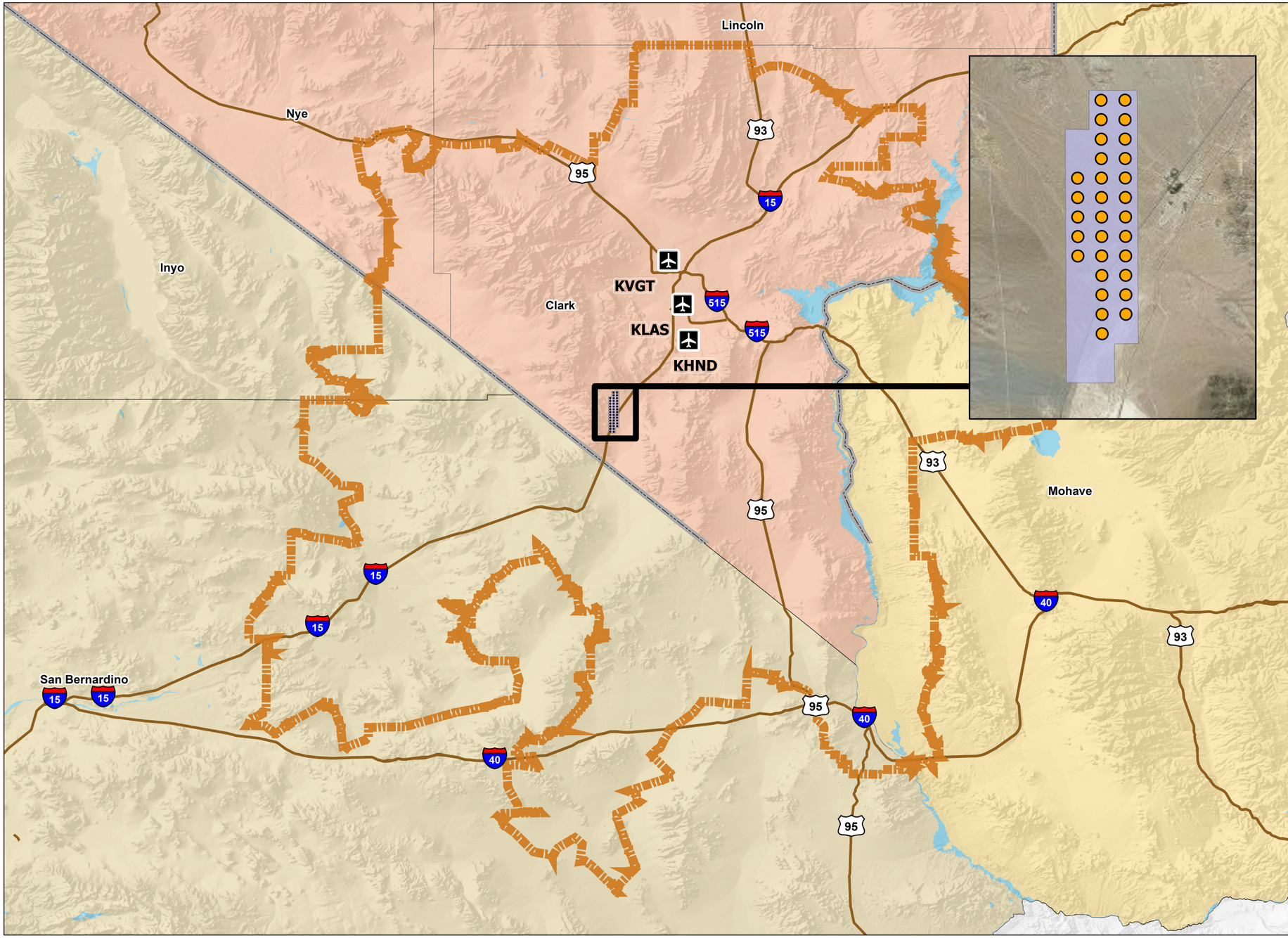

LEGEND

- Evenly-Spaced Grid Centroid Exposed to a DNL 45 to 60 dB with a DNL 5 dB Increase
- Area of Potential Effect
- General Study Area Boundary
- Study Airports
- US and Interstate Highways
- State Boundary
- Water

General Study Area Counties

- Arizona Counties
- California Counties
- Nevada Counties

Notes:

KHND Henderson Executive Airport
KLAS Mc Carran International Airport
KLSV Nellis Air Force Base
KVGT North Las Vegas Airport

Coordinate System: GCS WGS 1984
Datum: WGS 1984

Scale: 1:1,392,546

0 5 10 20 Miles

N

Sources: Road Network File, U.S. Census Bureau, 2017 (2017 TIGER/Line Shapefiles (machine-readable data files), County Boundary File, US Census Bureau, (2017 TIGER/Line Shapefiles (machine-readable data files); World Imagery, Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.Airports file, Federal Aviation Administration, 2018 Coded Instrument Flight Procedures (CIFP). Shaded Relief, 2018. ATAC Corporation, 2018, (2018 General Study Area boundary).
Prepared by: ATAC Corporation, November 2019.

Exhibit 5-2

Reportable Noise Increases in the General Study Area - 2025

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5.1.4 Noise Sensitive Uses and Areas

In addition to disclosing potential noise impacts to residential population, FAA Order 1050.1F requires the FAA to identify and describe noise sensitive uses and areas in the General Study Area. As defined in Paragraph 11-5b(10) of FAA Order 1050.1F, a noise sensitive area is "an area where noise interferes with normal activities associated with its use. Normally, noise sensitive areas include residential, educational, health, and religious structures and sites, and parks, recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites." Potential impacts to residential population are discussed in Sections 5.1.3. Potential impacts to recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites are discussed in Sections 5.2 and 5.3. Excluding these resources, **Appendix I** Table A7.1 lists those locations identified as noise sensitive in the General Study Area and reports the noise values associated with each location. For these locations, the noise analysis results indicate that the Proposed Action when compared to the No Action Alternative would not result in a DNL 1.5 dBA or higher increase in locations exposed to DNL 65 dB or higher. Hence there would not be a significant impact. Nor would these locations experience reportable noise increases between DNL 60 dB and 65 dB or DNL 45 dB and 60 dB.

5.1.5 Noise Compatible Land Use

FAA Order 1050.1F requires that EA documents discuss possible conflicts between the Proposed Action and the objectives of federal, regional, state, local, and tribal land use plans, policies, and controls for the area concerned. Analysis of the potential impacts to noise compatible land use was focused on changes in aircraft noise exposure resulting from implementing the Proposed Action. FAA Order 1050.1F states, "The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impact. If the noise analysis concludes that there is no significant impact, a similar conclusion usually may be drawn with respect to compatible land use." Air traffic actions like the Las Vegas Metroplex Project do not result in direct impacts to land such as ground disturbance. Accordingly, the compatible land use analysis relies on changes in aircraft noise exposure between the Proposed Action and the No Action Alternative (discussed in Section 5.1) as the basis for determining compatible land use impacts within the General Study Area.

5.1.5.1 Potential Impacts – 2020 and 2025

As stated in Section 5.1, the Proposed Action, when compared with the No Action Alternative, would not result in changes in aircraft noise exposure in 2020 and 2025 that would exceed the FAA's significance threshold. Likewise, there are no conflicts with federal, regional, state, or local land use plans, policies, and controls. Therefore, the Proposed Action would not result in significant compatible land use impacts.

Under the No Action Alternative, there would be no changes to air traffic routing in the General Study Area and no changes in aircraft noise exposure expected to occur in either 2020 or 2025. Therefore, the No Action Alternative would not result in significant compatible land use impacts.

5.2 Department of Transportation Act, Section 4(f) Resources

This section discusses potential impacts to Department of Transportation (DOT) Act, Section 4(f) Resources. In Chapter 4, **Exhibit 4-4** depicts Section 4(f) resources within the General Study Area as described in Section 4.3.3.

5.2.1 Summary of Impacts

Any changes in aircraft traffic patterns would occur at altitudes and distances from viewers that would not substantially impair the view or setting of Section 4(f) resources. Although some archaeological Section 4(f) resources would be exposed to a reportable increase in aircraft noise, they would not be adversely affected. Therefore, the Proposed Action would not involve the use of Section 4(f) resources and there would be no significant impact on those resources.

Under the No Action Alternative, no changes in air traffic routes in the General Study Area would occur. Therefore, no changes to aircraft noise exposure or aircraft overflight patterns would occur over Section 4(f) resources and no impacts would be anticipated.

5.2.2 Methodology

The FAA evaluates potential effects on Section 4(f) resources in terms of both physical impacts (i.e., physical use) and non-physical impacts (i.e., constructive use). A physical impact would occur as a result of land acquisition, construction, or other ground disturbance activities that would result in physical use of all or a portion of a Section 4(f) property. As land acquisition, construction, or other ground disturbance activities would not occur under either the Proposed Action or the No Action Alternative, neither alternative would have the potential to cause a physical impact to a Section 4(f) resource. Therefore, analysis of potential impacts to Section 4(f) resources is limited to identifying non-physical impacts resulting from constructive use. A constructive use of a Section 4(f) resource would occur if there were a substantial impairment of the resource to the degree that the activities, features, or attributes of the site that contribute to its significance or enjoyment are substantially diminished. This could occur as a result of both visual and noise impacts. Concerning aircraft noise, a constructive use would occur if noise levels substantially impair the resource. Refer to Section 5.9, Visual Impacts, regarding potential visual impacts within the General Study Area.

Noise exposure levels were calculated for grid points placed at Section 4(f) resources. A list of the resources evaluated is provided in **Appendix I**. Section 5.1.2 includes further discussion on the grid points used in the Section 4(f) analysis. The analysis of potential impacts to Section 4(f) resources considered whether these resources would experience a significant or reportable noise increase when comparing the Proposed Action with the No Action Alternative using the applicable thresholds shown in **Table 5-2**.

FAA Order 1050.1F identifies additional factors in deciding whether to apply the thresholds listed above to determine the significance of noise impacts on Section 4(f) resources. If a reportable noise increase were to occur, the Section 4(f) resources would be evaluated further to determine if the project-related effects would constitute a constructive use. Further evaluation can include confirming that the property is in fact a Section 4(f) resource and identifying the specific attributes for which the resource is managed (e.g., for traditional

recreational uses or where other noise is very low and a quiet setting is a generally recognized purpose and attribute).

In cases where Land and Water Conservation Fund Act (LWCF)[56] resources are "used" by a transportation project, FAA Order 1050.1F stipulates that a replacement satisfactory to the Secretary of the Interior is required for recreation lands aided by the Department of Interior's LWCF. Therefore, these resources are considered as part of the Section 4(f) impact analysis process.

5.2.3 Potential Impacts – 2020 and 2025

As stated in Section 5.1, the Proposed Action, when compared with the No Action Alternative, would not result in significant increases in aircraft noise exposure in 2020 or 2025 at any Section 4(f) resource. As discussed in Section 5.3, the Proposed Action would result in reportable noise increases in an area that contains archeological resources eligible for listing on the National Register of Historic Places, but those Section 4(f) resources would not be adversely affected.[57] Noise analysis results for Section 4(f) resources located within the General Study Area can be found in Appendix 5 of **Appendix I**. As stated in Section 5.9, the Proposed Action, when compared with the No Action Alternative, would not cause a significant visual impact in 2020 and 2025. Any changes in aircraft traffic patterns would occur at altitudes and distances from viewers that would not substantially impair the view or setting of the Section 4(f) resources. Therefore, the Proposed Action would not involve the use of Section 4(f) resources and there would be no significant impact on those resources..

Under the No Action Alternative, no changes to air traffic routes in the Las Vegas Metroplex would occur in either 2020 and 2025, and no effects related to changes in aircraft noise exposure or impairment to the view or setting of Section 4(f) resources would be anticipated. Therefore, the No Action Alternative would not result in potential impacts to Section 4(f) resources.

5.3 Historic and Cultural Resources

This section discusses the analysis of impacts to historic and cultural resources under the Proposed Action and the No Action Alternative. Section 4.3.3 provides information on historic or cultural resources within the General Study Area and the 18K Supplemental Boundary Area. Because the Proposed Action is an "undertaking" under Section 106 of the National Historic Preservation Act (NHPA), the FAA engaged in consultation in accordance with the regulations implementing that section.[58] The FAA originally delineated the Area of Potential Effect (APE) as coterminous with the General Study Area, and the agency initiated consultation with the State Historic Preservation Officers (SHPOs) for the States of Arizona, California, and Nevada; 36 Indian tribes the FAA identified within a 250-mile radius of the Las Vegas area; and Tribal Historic Preservation Officers (THPOs) of Indian tribes that may have interests within the General Study Area. After the FAA revised the APE (see Section 5.3.2), the remaining consulting parties were the Nevada SHPO, the National Park Service National Trails Office, the Bureau of Land Management, and Clark County. For additional information,

56 16 U.S.C. §§ 460l-4, et seq.

57 Although the General Study Area includes a 2.5 statute-mile portion of the Old Spanish Trail that would experience a reportable noise increase as a result of the Proposed Action, that resource is not subject to Section 4(f). See Appendix A (email dated December 12, 2019 from Jill Jensen of the National Park Service's National Trails Office).

58 36 C.F.R. part 800.

see **Appendix A** – *Agency Coordination, Community Involvement, and List of Receiving Parties*.

5.3.1 Summary of Impacts

The aircraft noise exposure analysis indicates that there would be no significant impact to the noise environment at any historic or cultural resources under the Proposed Action compared with the No Action Alternative. The aircraft noise exposure analysis indicates there would be reportable noise increases (see Exhibits 5-1 and 5-2) in the vicinity of the Jean Airport south-southwest of the City of Henderson within the General Study Area. Based on the FAA's review of relevant information and its consultation process under Section 106 of the NHPA, there are no historic or cultural resources in the Area of Potential Effect for which a quiet setting is a characteristic that would qualify it for listing in the NRHP or that could otherwise be affected by the modeled increases in aircraft noise exposure levels. Accordingly, the FAA has made a finding of "no adverse effect" on historic properties under Section 106 of the NHPA. The Nevada SHPO has concurred in this finding (see Appendix A). Therefore, the FAA has determined that the Proposed Action would not significantly affect historic or cultural resources.

Under the No Action Alternative, no changes to air traffic routes in the Las Vegas Metroplex would occur in either 2020 or 2025 and no changes to aircraft noise exposure or changes in aircraft overflight patterns over historic or cultural resources would be anticipated. Therefore, no historic or cultural resources would be affected by aircraft noise, nor would there be any visual impacts at historic or cultural resources under the No Action Alternative.

5.3.2 Methodology

Section 106 of the NHPA requires the FAA to consider the effects of its undertakings on historic properties listed or eligible for listing in the National Register of Historic Places (NRHP). Exhibit 4-5 in Section 4.3.3 shows the historic and cultural resources listed in the NRHP that are found within the General Study Area and the 18K Supplemental Boundary Area. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. The Proposed Action is located above the ground and does not involve the construction, disturbance, or alteration of any physical structure on, in, or emanating from the ground.

Federal regulations implementing Section 106 of the NHPA require the FAA to define an area of potential effect (APE) as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.[59] The Las Vegas Metroplex Project's potential effects would be limited to non-physical effects of aircraft overflights. At the time consultation with the SHPO was initiated, the FAA had initially defined the APE as coterminous with the General Study Area boundary. Because the Proposed Action's potential effects would be limited to non-physical effects of aircraft overflights, the FAA considered the potential for the Proposed Action to introduce visual, atmospheric, or

59 Title 36 CFR 800.16(d).

audible elements that could diminish the integrity of a historic property's significant historic features. The FAA compared the proposed flight procedures in the Proposed Action with current flight tracks within the General Study Area. Based on this comparison, the FAA determined that there would be no new areas overflown within the General Study Area, and therefore no potential to introduce new visual, atmospheric, or audible elements.

The FAA also considered the potential for the Proposed Action to have noise effects that could alter the character or use of historic properties. As discussed in Section 5.1, *Noise and Compatible Land Use*, the FAA's noise modeling analysis indicated that the Proposed Action would not result in any noise increase that would be "significant" under FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. However, that order recognizes that the "significant" standard may not be relevant to determining the potential for effects on certain historic properties where a quiet setting is a generally recognized purpose and attribute. Accordingly, the FAA redefined the APE to focus on the potential for "reportable" noise increases resulting from the Proposed Action to cause adverse noise effects on historic properties. Once the FAA identified the instances of reportable noise (see Section 5.1.3), the reportable noise grid points depicted in Exhibits 5-1 and 5-2 were combined and bounded. The number of reportable noise grid points in 2020 was greater than 2025; therefore, the redefined APE was determined based upon the 2020 reportable noise results. The resulting APE, roughly rectangular in shape and approximately 13.5 square miles in size, extends north-south just west of the Jean Airport. See **Exhibit 5-1** for the location of the revised APE within the project General Study Area.

The revised APE is located in Clark County and includes an approximately 2.5 statute-mile portion of the Old Spanish Trail, as well as portions of US Interstate 15, County Road 161 (Goodsprings Road), and an aerobatic box (used primarily by aircraft operating at the Jean Airport). It does not contain any tribal lands. The revised APE is adjacent to the Jean Airport, a U.S. Postal facility, a casino hotel complex, a state correctional facility, and a gas station/convenience store/fast food complex.

Aircraft have been operating in the Las Vegas Metroplex area since approximately 1920.[60] McCarran International Airport was officially opened in 1948, and by 1959 had nearly one million annual passengers.[61] Jet traffic has served the region since the mid-1950s.[62] For example, the Jean Airport, which is adjacent to the APE, has served general aviation aircraft and sport aviation activities for over 40 years. Within the APE, there is a sport aviation aerobatic practice box defined on the ground by markers and imagined by pilots according to International Aerobatic Club criteria. This aerobatic box is used by International Aerobatic Club (IAC) – Las Vegas 777 chapter approved and authorized aircraft operating predominantly to and from the adjacent Jean Airport. The aerobatic practice box is 1,000m x 1,000m and extends from the surface to 6,500 feet MSL. The Jean Airport aircraft traffic pattern operates in westerly direction towards the APE due to terrain to the immediate east. Sailplane activities (soaring), parachuting activities, and other recreational and sport aviation activities occur regularly over the defined APE. Additionally, the APE is exposed to existing surface transportation traffic. US Interstate 15 and County Road 161 (Goodsprings Road)

60 "Howard W. Cannon Aviation Museum". Clark County, Nevada. www.clarkcountynv.gov/parks/pages/cannon-aviation-musem.aspx

61 "McCarran International Airport" http://www.onlinenevada.org/articles/mccarran-international-airport

62 Id.

traverse the APE with Highway 15 carrying the majority of traffic between the Las Vegas Valley and California.

There are no historic properties within the revised APE that are listed in the National Register of Historic Places. However, as noted above, the revised APE includes a 2.5 statute-mile portion of the Old Spanish Trail, which is co-administered by the Bureau of Land Management (BLM) and the National Park Service (NPS). The FAA consulted with the National Park Service's National Trails Office for the Old Spanish Trail. According to that office, with concurrence from its counterpart in BLM, the revised APE does not include land of historic significance under the criteria for listing in the NRHP.

Since the revised APE contains other BLM lands and is located within Clark County, BLM and Clark County were also consulting parties. BLM did not identify any potentially eligible or listed properties within the revised APE. Clark County, through the Administrator of the Clark County Museum System, identified one property in the revised APE: a large concrete arrow on the ground approximately one mile south of Jean and east of I-15. The arrow was part of an airmail route that was in use from the 1920s to the 1960s. Based on the information provided by the county, the FAA considered the concrete arrow to be potentially eligible for listing in the NRHP.

The FAA also reviewed the Nevada Cultural Resources Information System (NVCRIS). That review confirmed that there were no NRHP-listed properties in the revised APE. The NVCRIS database showed only archaeological sites to be present in the revised APE. Some are associated with standing structures, such as the gas station, or are transportation related features such as road and rail segments. There are no historic homes or districts, and none of the sites are managed for recreation, or with a quiet setting as part of their historic character.

There are no tribal lands in the revised APE. However, in addition to the identification efforts discussed above, the FAA had engaged in extensive outreach with Federally-recognized tribes that the FAA identified within a 250-mile radius of the Las Vegas area. In a letter dated July 13, 2017, the FAA invited 35 tribes to participate in consultation under Section 106 of the NHPA. The letter requested information from the tribes on any locations within a 70-mile radius of McCarran International Airport (essentially the General Study Area) to which they attached religious or cultural significance. In the letter, the FAA offered to meet with the tribes to provide an overview of the Project and request their input. In a letter dated September 17, 2018, the FAA again sought input from the tribes (and one additional tribe) on any Project-related concerns and invited the tribes to meet with the FAA to receive information about the Project and provide their input. The FAA also sought information on historic properties in the General Study Area in a letter, dated October 25, 2018, to Tribal Historic Preservation Officers (THPOs) of tribes within the General Study Area, namely the: Pyramid Lake Paiute Tribe, Reno-Sparks Indian Colony, Washoe Tribe, Colorado River Indian Tribes, Hualapai Tribe, Timbisha Shoshone Tribe, and Twenty- Nine Palms Band of Mission Indians. The only tribe that responded to these FAA letters was the Hualapai Tribe, which expressed interest in consulting in person with the FAA regarding the Las Vegas Metroplex Project. On March 26, 2019, the FAA's Western Pacific Region Deputy Regional Administrator and other FAA representatives met with the Chairman of the Hualapai Tribe to discuss the Project. The Chairman expressed no concerns regarding the Project, nor did he identify any traditional cultural properties or other historic properties.

5.3.3 Potential Impacts – 2020 and 2025

Because the revised APE is based on the potential for increased aircraft noise from the Proposed Action to alter the character or use of historic properties, the FAA's assessment of effects considered whether the noise increases from the Proposed Action in the revised APE would diminish the integrity of a property's significant historic features. The results of the FAA's noise modeling analysis indicate the Project would cause an increase in aircraft noise exposure that would be "reportable" under FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. Specifically, the FAA's analysis shows that the increase in aircraft noise exposure in the APE, expressed as the Day-Night Average Noise Level (DNL), would range from 5 to 8.8 dB, with the resulting aircraft noise exposure levels ranging from DNL 45 dB to DNL 47.2 dB. These increases are well below what FAA Order 1050.1F defines as "significant" when evaluating potential impacts for National Environmental Policy Act purposes (see Section 5.1.2). FAA Order 1050.1F recognizes that the "significant" standard may not be relevant to determining the potential for effects on certain historic properties where a quiet setting is a generally recognized purpose and attribute. As noted above, the FAA's review of the NVCRIS showed only archeological sites in the revised APE, none of which are managed with a quiet setting as part of their historic setting. Based on the FAA's review of the NVCRIS, it concluded that the modeled increases in aircraft noise exposure from the Proposed Action would have no effect on these archaeological resources or their ability to yield important information in the future.

Furthermore, the consultation process under Section 106 of the NHPA has not revealed any historic or cultural resource within the revised APE for which a quiet setting is a characteristic that would qualify it for listing in the NRHP or that could otherwise be affected by the modeled increases in aircraft noise exposure levels.

Based on this analysis, the FAA determined that the Proposed Action would not adversely affect any historic or cultural properties. Accordingly, the FAA made a finding of "no adverse effect" on historic properties under Section 106 of the NHPA. The Nevada SHPO has concurred in this finding (see Appendix A). Therefore, the FAA has determined that the Proposed Action would not significantly affect historic or cultural resources.

Under the No Action Alternative no changes to air traffic routes in the Las Vegas Metroplex would occur in either 2020 or 2025, and no adverse effects related to changes in aircraft noise exposure would be anticipated. Therefore, the No Action Alternative would not result in an adverse effect to historic or cultural resources.

5.4 Wildlife (Avian and Bat Species) and Migratory Birds

This section discusses the analysis of potential impacts to avian and bat species under the Proposed Action and the No Action Alternative.

5.4.1 Summary of Impacts

The greatest potential for impacts to wildlife species would result from wildlife strikes on avian and bat species at altitudes below 3,000 feet AGL. Changes to flight paths under the Proposed Action would primarily occur at or above 3,000 feet AGL. Therefore, the Proposed Action would not result in significant impacts to avian and bat species when compared with the No Action Alternative.

The No Action Alternative would not involve changes to air traffic flows, land acquisition, construction, or other ground disturbance activities. Therefore, the No Action Alternative would not result in significant impacts to fish, wildlife, or plants.

5.4.2 Methodology

The FAA's *Wildlife Strike Database* is the best information available for assessing potential impacts of aircraft on wildlife. Strike reports over the past 25 years aggregated nationally, as well as for individual airports, are available from the database to understand existing conditions. Strike reports are comparable to known information on the presence of specific species of concern to corroborate the reports.

This analysis involved a review of wildlife strike reports[63] for the Study Airports under both the Proposed Action and the No Action Alternative, and an evaluation of the potential for the presence of federal- and state-listed threatened and endangered species (i.e., special-status species) within the General Study Area. The FAA compared modifications in flight procedures to the occurrence of special-status species to qualitatively assess the likelihood of whether wildlife strikes might change under the Proposed Action.

5.4.3 Potential Impacts – 2020 and 2025

A significant impact would be likely to occur if the Proposed Action were to jeopardize the existence of special-status species or result in destroying or adversely modifying critical habitat in the General Study Area. Changes to flight paths under the Proposed Action would primarily occur at or above 3,000 feet AGL, so there is no potential for these effects in the General Study Area. Accordingly, the analysis is focused on the potential for significant impacts to species resulting from increased wildlife strikes with aircraft.

Since 1990, the FAA has compiled reports of wildlife strikes with aircraft. The information is available to the public through the FAA's *Wildlife Strike Database* and the "Annual Report: Wildlife Strikes to Civil Aircraft in the United States." Between 1990 and 2018, the Wildlife Strike Database reported 222,978 wildlife strikes nationally.[64] Of the records that identify the type of animal involved in the strike incident, birds represent 96 percent of all strikes.[65] Of those records, for commercial and GA aircraft, 71 and 72 percent respectively, of the strikes occurred at or below 500 feet AGL and declined by 34 percent for every 1,000-foot gain in height for commercial aircraft and 44 percent for general aviation aircraft. The Wildlife Strike Database reports that of identified species, waterfowl, gulls, and raptors are the species groups of birds with the most damaging strikes.[66]

Table 5-4 provides a summary of wildlife strikes reported for the Study Airports between January 1, 1990 and December 31, 2018. In total, 581 reported strikes occurred at the study airports. 174 reported strikes did not include altitude information. Of the 407 reported strikes that included altitude information, 240 occurred at altitudes less than or equal to 3,000 feet AGL. A total of 158 strikes reported at the Study Airports included species identification.

63 U.S. Department of Transportation, Federal Aviation Administration, *Wildlife Strike Database* (http://www.faa.gov/airports/airport_safety/wildlife/database/; Accessed October 2019).

64 Federal Aviation Administration. Wildlife Strikes to Civil Aircraft in the United States 1990-2018, July 2019

65 Id.

66 Id.

The *Migratory Bird Treaty Act (MBTA) of 1918* (16 U.S.C. §§ 703–712) protects all the bird species identified in these reports. Furthermore, federal and state laws protect listed endangered and threatened species. In Chapter 4, **Table 4-3** identifies the ten federally-listed bird species found in counties in the General Study Area. None of the bird strike reports at the Study Airports included the species listed in **Table 4-3**.

The number of aircraft operations under the Proposed Action and No Action Alternative would be the same. Therefore, the assessment of the potential impacts focuses on changes to flight paths and the potential for impact due to wildlife strikes. As shown in **Table 5-4**, only 167 of bird/bat strikes (an average of 5.97/year) occurred at altitudes above 3,000 feet AGL. The decline in the number of strikes reported above 3,000 feet AGL indicates that there is less likelihood of bird/bat strikes at these altitudes. Under the Proposed Action, changes to proposed flight paths would primarily occur at or above 3,000 feet AGL and no significant changes to arrival and departure corridors below 3,000 feet AGL would be expected. Therefore, no significant impacts to bird or bat species would occur.

The No Action Alternative would not involve changes to air traffic flows, land acquisition, construction, or other ground disturbance activities. Therefore, no impacts to avian and bat species would occur.

Table 5-4 Study Airport FAA Wildlife Strike Database Records by Altitude (1990 – 2018)

Type of Strike	Airport	3,000 ft. AGL or less	>3,000 ft. AGL to ≤ 10,000 ft. AGL	Greater than 10,000 ft. AGL	Total
Identified Bird and Bat Species	LAS	50	7	3	60
	HND	0	0	0	0
	VGT	4	1	0	5
Total		54	8	3	65
Unknown Bird and Bat Species	LAS	182	134	21	337
	HND	1	0	0	1
	VGT	3	1	0	4
Total		186	135	21	342
Grand Total		240	143	24	407
Annual Average		8.57	5.11	0.86	14.54

Source: U.S. Department of Transportation, Federal Aviation Administration, *FAA Wildlife Strike Database* (http://wildlife-mitigation.tc.faa.gov/wildlife/default.aspx) accessed October 14, 2019.
Prepared by: ATAC Corporation, November 2019.

5.5 Environmental Justice

This section presents a summary of the analysis of environmental justice impacts under the Proposed Action and the No Action Alternative.

5.5.1 Summary of Impacts

Neither the Proposed Action nor the No Action Alternative would displace people or businesses; therefore, implementing the Proposed Action or No Action Alternative would not result in direct impacts in this category. No areas within the General Study Area would experience significant impacts to air quality or noise. While some areas would be exposed to reportable noise increases of DNL 5 dB within areas exposed to DNL 45 to 60 dB, these would not constitute a significant impact related to a change in DNL exposure to people, including members of minority and/or low-income populations (see Section 5.1). Therefore,

no disproportionately high and adverse effects to minority populations or low-income populations would occur under either the Proposed Action or the No Action Alternative.

5.5.2 Methodology

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that federal agencies include environmental justice as part of their mission by identifying and addressing as appropriate, the potential for disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. Environmental justice applies to all environmental resources. Therefore, a disproportionately high and adverse human health or environmental effect on minority and low-income populations may represent a significant impact.

5.5.3 Potential Impacts – 2020 and 2025

Under the Proposed Action, neither people nor businesses would be displaced. As discussed in Section 5.1, under the Proposed Action, no census block centroids in the General Study Area would experience a change in noise exposure in 2020 or 2025 that exceeds any of the FAA's significance or reportable thresholds for noise impacts on people. Therefore, no adverse direct or indirect effects would occur to any environmental justice populations within the General Study Area under the Proposed Action for 2020 and 2025.

Under the No Action Alternative, neither people nor businesses would be displaced. Furthermore, air traffic routes would not change and there would be no change in aircraft noise exposure in 2020 or 2025 that could result in an indirect impact. Therefore, the No Action Alternative would not result in disproportionately high and adverse human health or environmental effects on minority and low-income populations.

5.6 Energy Supply (Aircraft Fuel)

This section discusses whether changes in the movement of aircraft would result in measurable effects on local energy supplies under the Proposed Action and the No Action Alternative.

5.6.1 Summary of Impacts

In comparison to the No Action Alternative, the Proposed Action would result in a relatively small decrease in aircraft fuel burned in 2020 of 0.03 percent within the 18K Supplemental Boundary Area. The Proposed Action would result in a slight increase in aircraft fuel burned in 2025 of 0.12 percent within the 18K Supplemental Boundary Area. These increases would not be expected to affect local aircraft fuel supplies. Therefore, no significant impacts to energy supply would be anticipated.

The No Action Alternative would not involve changes to air traffic flows, construction, or other ground disturbance activities. Therefore, the No Action Alternative would not result in the depletion of local energy supply.

5.6.2 Methodology

The Proposed Action would not change the number of aircraft operations relative to the No Action Alternative, but it would involve changes to air traffic flows during the departure, descent, and approach phases of flight. These changes affect both the route an aircraft may follow as well as its climb-out and descent profiles. This in turn may directly affect aircraft fuel burn (or fuel expended). Aircraft fuel burn is considered a proxy for determining whether the Proposed Action would have a measurable effect on local fuel supplies when compared with the No Action Alternative.

In addition to calculating aircraft noise exposure, the FAA's AEDT 2d model calculates aircraft-related fuel burn (e.g., AAD flight schedules, flight tracks, and runway use). See Section 5.1.2 for further discussion on AEDT 2d input data. Determining the difference in fuel burn between alternatives can be used as an indicator of changes in fuel consumption resulting from implementation of the Proposed Action when compared with the No Action Alternative.

5.6.3 Potential Impacts – 2020 and 2025

Table 5-5 presents the results of the fuel burn analysis for the Proposed Action and No Action Alternative. In comparison to the No Action Alternative, the Proposed Action would result in a relatively small decrease in aircraft fuel burned in 2020 of -0.03 percent. The proposed Action would result in a slight increase in aircraft fuel burned in 2025 of 0.12 percent. Given a total compared increase of 0.09 percent, the FAA expects that when compared with the No Action Alternative, the Proposed Action would not have a measurable effect on local fuel supplies. Therefore, no significant impacts to energy supply would be anticipated.

Table 5-5 Energy Consumption Comparison

	2020		2025	
	No Action Alternative	**Proposed Action**	**No Action Alternative**	**Proposed Action**
Fuel Burn (MT)	939.30	939.00	1,049.33	1,050.58
Weight Change (MT) (Proposed Action – No Action Alternative)		-0.30		1.25
Percent Change from No Action Alternative		-0.03%		0.12%

Note: MT = Metric Ton

Source: ATAC Corporation, April 2020 (AEDT 2d modeling results).
Prepared by: ATAC Corporation, April 2020.

5.7 Air Quality

This section discusses the analysis of air quality impacts under the Proposed Action and the No Action Alternative.

5.7.1 Summary of Impacts

As an action designed to improve the efficiency of flight procedures and airspace utilization (see Section 2.2), the Proposed Action would be expected to have little, if any, effect on air quality. Although the FAA's modeling shows that in 2025 there would be a slight increase in emissions in the 18K Supplemental Boundary Area when compared to the No Action

Alternative, any increase in emissions would occur at or above 3,000 feet AGL and therefore would be *de minimis*. Therefore, no significant impacts to air quality would be anticipated.

The No Action Alternative would not result in a change in the number of aircraft operations or air traffic routes; therefore, no impacts to air quality would be anticipated.

5.7.2 Methodology

Section 176(c) of the Clean Air Act (CAA) requires that federal actions conform to the appropriate SIP in order to attain the air quality goals identified in the CAA. The definition of "conformity" in that section includes that a federal activity will not cause or contribute to any new violation of any NAAQS or increase the frequency or severity of any existing violation of any NAAQS. This definition is incorporated in the definition of "significance" for air quality impacts of FAA actions.[67] A conformity determination is not required if the emissions caused by a federal action would be less than *de minimis* levels established in regulations issued by EPA.[68] The EPA regulations identify certain actions that would not exceed these thresholds, including ATC activities and adoption of approach, departure, and en route procedures for aircraft operations above the mixing height specified in the applicable SIP (or 3,000 feet AGL in places without an established mixing height).[69] In addition, the EPA regulations allow federal agencies to identify specific actions as "presumed to conform" (PTC) to the applicable SIP.[70] In a notice published in the Federal Register, the FAA identified several actions that "will not exceed the applicable *de minimis* emissions levels" and, therefore, are presumed to conform, including ATC activities and adoption of approach, departure, and en route procedures for air operations.[71] The FAA's PTC notice explains that aircraft emissions above the mixing height do not have an effect on pollution concentrations at ground level. The notice also notes that "air traffic actions below the mixing height are also presumed to conform when modifications to routes and procedures are designed to enhance operational efficiency (i.e., to reduce delay)."[72]

5.7.3 Potential Impacts – 2020 and 2025

The Proposed Action is designed to improve the efficiency of flight procedures and airspace utilization in the Las Vegas Metroplex (see Section 2.2). Therefore, it is presumed to conform to the applicable SIP.[73] The results of the FAA's modeling of the Proposed Action's effect on aircraft fuel burn (see Section 5.6) indicate that in the 18K Supplemental Boundary Area, the Proposed Action would result in a slight decrease in fuel burn (-0.03 percent) in 2020 and a slight increase in fuel burn (0.12 percent) in 2025 when compared to the No Action Alternative. While increased fuel burn corresponds with an increase in emissions, the changes in flight procedures that could result in an increase in fuel burn would occur at or above 3,000 feet AGL, and any increase in emissions from these changes would be *de minimis*.[74] Therefore, no further air quality analysis is necessary, a conformity determination

67 See FAA, *1050.1F Desk Reference*, Section 1.3.6, July 2015.

68 40 C.F.R. § 93.153(b).

69 40 C.F.R. § 93.153(c)(2)(xxii).

70 40 C.F.R. § 93.153(f).

71 Federal Presumed to Conform Actions under General Conformity, 72 Fed. Reg. 41565 (July 30, 2007).

72 Id.

73 72 Fed. Reg. 41578 (July 30, 2007).
74 40 C.F.R. § 93.153(c)(2)(xxii).

is not required, and the FAA has determined that the Proposed Action would not result in a significant impact to air quality.

The No Action Alternative would not result in a change in the number of aircraft operations or air traffic routes; therefore, no impacts to air quality would be anticipated.

5.8 Climate

This section discusses greenhouse gas (GHG) emissions and effects to the climate as they relate to the Proposed Action and the No Action Alternative.

5.8.1 Summary of Impacts

Although fuel burn within the 18K Supplemental Boundary would increase slightly under the Proposed Action as compared to the No Action Alternative, no significant impacts to the climate would be anticipated.

The No Action Alternative would not result in a change in the number of aircraft operations or air traffic routes; therefore, no impacts to climate would be anticipated.

5.8.2 Methodology

In accordance with FAA guidance, estimated CO_2 emissions within the 18K Supplemental Boundary were calculated from the amount of fuel burned under the No Action Alternative and the Proposed Action in 2020 and 2025 (see Section 5.8). The resulting CO_2 emissions were then reported as CO_2e (carbon dioxide equivalent).

5.8.3 Potential Impacts – 2020 and 2025

Table 5-6 shows project-related CO_2e emissions. In 2025, the Proposed Action would produce approximately 3,315 MT of CO2e, and the No Action Alternative would produce approximately 3,311 MT of CO2e. This represents a slight increase of approximately 4 MT of CO2e or 0.12 percent under the Proposed Action when compared to the No Action Alternative. This would compromise less than 0.000279 percent of U.S.-based greenhouse gas emissions as reported for 2014[75] and less than 0.00004 percent of global greenhouse gas emissions as reported for 2014.[76] Similarly, in 2020, the No Action Alternative would produce approximately 2,964 MT of CO2e, and the Proposed Action would produce approximately 2,963 MT of CO2e. This represents a slight decrease of approximately 1 MT of CO2e or -0.03 percent under the Proposed Action when compared to the No Action Alternative. This would compromise less than 0.000070 percent of U.S.-based greenhouse gas emissions as reported for 2014 and less than 0.000011 percent of global greenhouse gas emissions as reported for 2014.

75 Boden, T.A., Marland, G., and Andres, R.J. (2017). National CO2 Emissions from Fossil-Fuel Burning, Cement Manufacture, and Gas Flaring: 1751-2014, Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, doi 10.3334/CDIAC/00001_V2017. Information Analysis Center (http://cdiac.ornl.gov/trends/emis/tre_coun.html#), accessed September 2017.

76 Id.

Table 5-6 CO_2e Emissions – 2020 and 2025

	2020		2025	
	No Action Alternative	**Proposed Action**	**No Action Alternative**	**Proposed Action**
CO_2e Emissions (MT)	2,963.49	2,962.56	3,310.62	3,314.59
Weight Change (MT)		-0.93		3.97
(Proposed Action – No Action Alternative)		-0.03%		0.12%

Note: CO_2e = Carbon Dioxide Equivalent

Source: ATAC Corporation, April 2020 (AEDT 2d modeling results).
Prepared by: ATAC Corporation, April 2020.

5.9 Visual Impacts

This section discusses the analysis of visual impacts under the Proposed Action and the No Action Alternative.

5.9.1 Summary of Impacts

As stated in Section 5.1, implementation of the Proposed Action would not increase the number of aircraft operations at the Study Airports compared with the No Action Alternative. Changes in aircraft traffic patterns under the Proposed Action are expected to be at altitudes and distances sufficiently removed from viewers that visual impacts would not be anticipated.

Under the No Action Alternative, no changes in air traffic routes would occur and no changes in aircraft overflight patterns would be expected. Therefore, the No Action Alternative would not result in visual impacts.

5.9.2 Methodology

As discussed in FAA Order 1050.1F, visual, or aesthetic, impacts are difficult to define and evaluate because of the subjectivity involved. Aesthetic impacts deal more broadly with the extent that the project contrasts with the existing environment and whether the difference is considered objectionable by the agency responsible for the location in which the project is set. Visual impacts are normally related to the disturbance of the aesthetic integrity of an area caused by development, construction, or demolition, and thus, do not typically apply to airspace changes.

To evaluate the potential for indirect impacts resulting from changes in aircraft routings and visual intrusion, the general altitudes at which aircraft route changes occur beyond the immediate airport environs which experience overflights on a routine basis and are considered to evaluate the potential for visual impacts.

5.9.3 Potential Impacts – 2020 and 2025

According to FAA Order 1050.1F, the visual sight of aircraft, aircraft contrails, or aircraft lights at night, particularly at a distance that is not normally intrusive, should not be assumed to constitute an adverse impact. Changes in aircraft routes associated with the Proposed Action would generally occur at altitudes above 3,000 feet AGL; therefore, the visual sight of aircraft and aircraft lights would not be considered intrusive. Consequently, the Proposed Action

would not result in significant visual impacts. Neither the Proposed Action nor the No Action Alternative would result in significant visual impacts.

5.10 Cumulative Impacts

Consideration of cumulative impacts applies to the impacts resulting from the implementation of the Proposed Action with other actions. CEQ regulations define a cumulative impact as "an impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."[77] The regulations also state that cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

5.10.1 Summary of Impacts

The implementation of the Proposed Action when considered with other past, present, and reasonably foreseeable future actions would not be expected to result in significant cumulative impacts.

The No Action Alternative would not result in a change in the number of aircraft operations or air traffic routes; therefore, no cumulative impacts would be anticipated.

5.10.2 Methodology

Due to the nature of the Proposed Action and its potential impacts (as described in Sections 5.1 through 5.9), the only potentially-relevant past, present, and reasonably foreseeable future actions for cumulative impact analysis are those that would have direct or indirect effects on aircraft flight patterns within the General Study Area. Research was conducted to identify any present or reasonably foreseeable (past actions are reflected in the environmental baselines described in Chapter 4) airport improvement projects at the Study Airports or FAA actions relating to airspace, flight procedures, or air traffic routes that would have the potential for such effects. This included reviewing capital improvement program (CIP) projects at the Study Airports that directly affect or involve runway surfaces having the potential to affect local or regional flight patterns. For these projects, five years corresponds to the typical CIP planning horizon and was therefore applied as the timeline for including projects to be reviewed. "Reasonably foreseeable future actions" refers to projects that would likely be completed by 2025.

The FAA evaluated the potential for cumulative impacts in those environmental resource categories listed in Section 4.3, *Potentially Affected Resource Categories or Sub-Categories*.

5.10.3 Potential Impacts – 2020 and 2025

As stated in **Section 5.10.2**, research was conducted to identify relevant airport improvement capital projects and airspace actions. This research did not reveal any present or reasonably foreseeable actions with the potential for direct or indirect effects on aircraft flight patterns

77 40 C.F.R § 1508.7

within the General Study Area.[78] Therefore, no cumulative impacts would be anticipated for the Proposed Action when compared to the No Action Alternative for either 2020 or 2025.

78 The LAS capital improvement program on file with the FAA includes an item relating to planning and environmental documentation for a new air carrier airport in the Ivanpah Valley, approximately 35 miles south-southwest of LAS. This project is not considered further in this EA because it is currently projected that the new airport would begin operation between the years 2035 and 2040, well beyond the temporal boundary of this cumulative impact evaluation, and information is not available that provides enough specificity to provide meaningful information for consideration in assessing the potential for cumulative impacts with the Proposed Action.