Four Corner-Post Plan

Final
Environmental Assessment

Prepared for:
U.S. Department of Transportation
Federal Aviation Administration
Western-Pacific Region

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July 2001

This Final Environmental Assessment becomes a Federal document when evaluated and signed by the responsible FAA official.

J. Clancy
Responsible FAA Official

June 26, 2001
Date

U.S. Department of Transportation

FEDERAL AVIATION ADMINISTRATION

Western-Pacific Region

FINDING OF NO SIGNIFICANT IMPACT
RECORD OF DECISION

For the

Las Vegas Four Corner-Post Plan
McCarran International Airport
Las Vegas, Nevada

June 2001

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I. INTRODUCTION

This document serves as a Finding of No Significant Impact (FONSI) and Record of the Decision (ROD) of the Federal Aviation Administration (FAA) to approve the Las Vegas Four Corner-Post Plan at McCarran International Airport in Las Vegas, Nevada. The Las Vegas Four Corner-Post Plan proposes changes within the Los Angeles Air Traffic Control Center (ARTCC) and the Las Vegas Terminal Radar Approach Control (TRACON) boundaries to increase safety, efficiency and ultimately reduce delays. This FONSI/ROD will describe the purpose and need of the project, the actions to be taken by the FAA, the alternatives examined in the Final Environmental Assessment (FEA) dated June 2001, the environmental effects of the preferred alternative, any committed mitigation, and the FAA's decision action. The nature and extent of the decision is clearly stated in this FONSI/ROD, which is a decision document.

The Las Vegas Four Corner-Post Plan is a part of the National Airspace Redesign (NAR). National Airspace Redesign (NAR) is a long-term project managed by the FAA's Air Traffic Airspace Management Office (ATA). NAR is tasked with evaluating the air traffic environment in the National Airspace System (NAS). In evaluating the air traffic environment NAR will develop a strategy that will increase system capacity while maintaining the highest standards of safety, improve flexibility and predictability, and decrease delay. Historically, the responsibility for airspace management has resided with FAA Regional offices and the responsibility for operational considerations within individual air traffic control facilities. National Airspace Redesign asserts an entire airspace system approach rather than incremental changes, local in scope, and centered on single areas of airspace concern. This is to be accomplished by a "top down" method, which means designing the most efficient enroute system possible and then developing routes to and from the terminal areas to compliment the new enroute environment.

Although the Las Vegas Four Corner-Post Plan was not a direct initiative of NAR, it has been recognized as being the foremost strategy in the southwest and west regions of the country. Greater delays at large commercial airports across the country are increasingly costing the users and the flying public more time and money to participate in the benefits of air transportation. National Airspace Redesign is specifically tasked

with designing an airspace environment that will enable air traffic to be managed efficiently, thereby benefiting the users and controllers of the national airspace system. The proposed modifications in the Las Vegas Four Corner-Post Plan would benefit the efforts set forth in NAR.

A Final Environmental Assessment (FEA) was prepared for the FAA to evaluate the significance of any potential environmental impact resulting from the implementation of the Las Vegas Four Corner-Post Plan. The FEA has satisfied the requirements of the National Environmental Policy Act (NEPA) and FAA guidelines identified in FAA Order 1050.1D, *Policies and Procedures for Considering Environmental Impacts*, for the preparation of an Environmental Assessment. The FEA has been independently reviewed by the FAA and found to be adequate for the purpose of the proposed Federal action.

II. PURPOSE AND NEED

The following section identifies the airspace problems associated with the Los Angeles ARTCC and the Las Vegas TRACON (the *need* for the Proposed Action) and the proposed solution to the problem (the *purpose* of the Proposed Action). In addition, the proposed time frame for the implementation of the Proposed Action is described.

Need for the Proposed Action

The need for the Las Vegas Four Corner-Post Plan (Proposed Action) is a direct result of the increasing demand at LAS, resulting in higher levels of operation. As demand increases, existing procedures become less efficient and increase the chances of inducing significant airspace delays.

The City of Las Vegas is unique in that it is recognized as a world-class resort destination and the foremost gaming and entertainment center in the United States. It is also the site of many large conventions and trade shows that bring large numbers of business travelers to Las Vegas in concentrated time frames. This continued demand for hotel and convention services is the primary reason for the increase in demand at LAS.

McCarran International Airport is the 9th busiest airport in the United States and is served by 28 air carriers. Based on data contained in the *Northeast Extension of Concourse D*, prepared for Clark County, the following demand forecasts are provided:

> "Passenger activity at LAS has increased from approximately 8.6 million enplanements in 1989 to approximately 16.9 million in 1999 – a total increase of 96 percent. This increase represents an average annual growth rate of about 7 percent. This large increase year after year can be attributed primarily to the rapid expansion of the Las Vegas economy, resident population growth, the development of major new resort complexes, and airlines providing service to Las Vegas at attractive fares. Also, a strong correlation has existed and continues to exist between the number of available hotel/motel rooms in the Las

Vegas area and the number of passengers enplaned at LAS. Passenger enplanements are expected to increase to approximately 37.9 million by 2020, representing an average annual growth rate of 3.9 percent. The capacity of LAS has been estimated at 27.5 million annual enplaned passengers.

Aircraft operations at LAS are projected to increase from 542,922 in 1999 to 705,000 by 2011. If airfield capacity did not constrain operations at LAS it is anticipated that annual aircraft operations would reach 724,160 by 2011 and 868,080 by 2020."

Less than optimum airspace design and procedures have created an impediment for air traffic controllers to efficiently manage the existing and forecast high traffic demand. Airspace inefficiencies in the Las Vegas TRACON are created because the existing approach and departure procedures use the same flight path corridors to the northeast, northwest, southeast, and southwest. This results in departing aircraft not being able to climb unrestricted and arriving aircraft being restricted to higher altitudes. These existing procedural conflicts are described in the FEA, Section 1.6, *Conflicts with Existing Procedures*.

Purpose of the Proposed Action

The purpose of the Las Vegas Four Corner-Post Plan (Proposed Action) is to address the air traffic/airspace inefficiencies resulting from increased demand at LAS. The, Proposed Action developed by the Los Angeles ARTCC and the Las Vegas TRACON includes a number of recommendations to improve the use of airspace, air traffic control procedures, reduce interaction with Nellis Air Traffic Control Facility, and reduce noise exposure to communities in the Las Vegas valley.

Existing coordination with Nellis Air Traffic Control Facility would be relieved because the majority of departing aircraft would be making left turns away from Nellis Air Traffic Control airspace. This left turn has the added benefit of reducing noise exposure over the city of Las Vegas. The proposed departure corridors were specifically designed to be located over sparsely populated areas initially and then transition to areas of no population.

The existing structure of the Las Vegas TRACON is an East Corner-Post system and has been in place since 1998. The East Corner-Post system was created to solve an aircraft sequencing problem that was occurring within Los Angeles ARTCC. The East Corner-Post system has only been an interim step to solving the greater airspace inefficiencies within the Los Angeles ARTCC and the Las Vegas TRACON. Thorough review of the existing approach and departure procedures at Las Vegas TRACON (in today's high demand environment) has determined that the Las Vegas TRACON needs to develop a Four Corner-Post Plan.

The proposed Las Vegas Four Corner-Post Plan is also a direction-based system that organizes aircraft from similar directions over a specific geographic position (referred to as fix). The proposed Las Vegas Four Corner-Post Plan further organizes airspace so

that aircraft arriving from similar directions are directed over a specific fix and aircraft departing to similar directions are directed over a different fix. This separates arrival traffic from departure traffic eliminating the need for altitude restrictions. The location of a fix is defined for pilots and controllers (in Classic procedures) by the location of a radio navigation aid or determined by reference to one or more radio navigation aids. Aircraft operating with advanced navigation equipment utilize RNAV procedures with fixes defined by earth-based coordinates (latitude and longitude).

As mentioned previously, National Airspace Redesign (NAR) is a growing initiative to allow for more efficient air traffic management. NAR has recognized the Four Corner-Post Plan as following its strategy of creating a more efficient airspace environment; one that will enable aircraft to enter enroute and TRACON airspace more efficiently. This recognition has given the Las Vegas Four Corner-Post Plan national support, and the funding needed to see the project through to implementation.

Finally, the Las Vegas Four Corner-Post Plan would allow aircraft to benefit from advanced navigation systems by developing RNAV procedures in addition to the classic procedures that utilize ground-based navigation aids. RNAV procedures do not rely upon such fixed facilities, but rely upon advanced on-board navigation computers capable of accurately identifying the aircraft's position and course along its route. RNAV equipment can compute aircraft position, actual track and ground speed, and information relative to a flight route selected by a pilot. RNAV procedures would alleviate operational complexity and increase controller flexibility. When fully implemented, RNAV would simplify operations for pilots and controllers and provide more defined flight paths that are intended to decrease noise exposure to the communities.

III. ALTERNATIVES

Initial scoping alternatives were developed by the FAA to advance aviation safety and reduce air traffic delays. Equally considered for these initial alternatives were the constraints posed by the existing system to manage the arrivals and departures within the boundaries of the Los Angeles ARTCC and the Las Vegas TRACON airspace.

Four initial alternatives were developed to assess potential airspace modifications while two additional alternatives assessed physical relocation of McCarran International Airport or combining of FAA and Department of Defense (DOD) air traffic control functions. The FAA qualitatively evaluated each initial alternative against the screening criteria as outlined in the FEA, Sections 2.1 and 2.2.

Initial Alternative 1 and initial Alternative 2 were the only alternatives that met the specified screening criteria and the purpose and need for the Las Vegas Four Corner-Post Plan. Therefore, initial Alternative 1 resulted in the No Action (Alternative 1) and initial Alternative 2 resulted in the Proposed Action (Alternative 2).

The advantages and disadvantages for the No Action (Alternative 1) and the Proposed Action (Alternative 2) are summarized below in accordance with the Council on Environmental Quality (CEQ) Section 1502.14:

Alternative 1: No Action
The No Action alternative would make no changes to the air traffic procedures or the airspace sectors in the Los Angeles ARTCC or the Las Vegas TRACON. Please refer to FEA, Section 1.5, *Existing Air Traffic Control Procedures,* for a complete description of these existing procedures.

Advantages: No controller training.

Disadvantages: The air traffic management issues that have been identified will not be addressed. As demand increases at LAS, the air traffic facilities will find it ever more difficult to manage aircraft traffic efficiently to and from the Las Vegas TRACON. The result of taking no action will be increased pilot and controller coordination, escalating delays as demand reaches capacity, and increased noise exposure to affected communities as demand increases.

Conclusion: Air traffic control facilities routinely and continually review and analyze air traffic procedures and traffic trends. This analysis provides insight into subtle traffic changes, airline scheduling impacts, changes to the air carrier and general aviation fleet, and noise exposure to communities. It provides a basis for planning staffing and equipment needs for the future. A No Action (Alternative1) would ultimately reduce air traffic movement efficiency, air traffic controller productivity and the airport's ability to handle demand, and would not address the possibility of increased noise exposure. Eventually the consumers, the airlines, and communities would realize the effects of no action and the associated costs.

Alternative 2: Proposed Action
The Proposed Action alternative would modify existing Standard Terminal Arrival Route (STAR) procedures and Departure Procedures (DPs) for LAS. This alternative would also increase the Las Vegas TRACON ceiling from 15,000 feet MSL to Flight Level 190 (19,000) feet MSL. Refer to the FEA, Section 1.9, *Description of the Proposed Action*, for a detailed description of this alternative.

Advantages: Several major advantages accrue as a result of the proposed changes. They provide a significant operational benefit and noise exposure reduction by eliminating the need for altitude restrictions, and significantly decreasing the amount of right turns over the City of Las Vegas. The proposed changes limit the need for coordination between Nellis RAPCON and Las Vegas TRACON thus reducing controller duties.

Disadvantages The implementation of advanced navigation capabilities will require controller and pilot training and require a transition period before the increased capabilities can be fully utilized, and the benefits fully realized.

Conclusion: This alternative meets the needs of the Los Angeles ARTCC and the Las Vegas TRACON to improve air traffic procedures and gain efficiency. It also provides local communities relief from aircraft noise while increasing noise in only a few areas. This alternative was determined to meet all the initial screening criteria.

Alternatives Excluded from Further Study:
In addition to the initial alternatives described in the FEA, Section 2.1, *Evaluation of the Initial Alternatives*, a number of other project alternatives were developed during the initial planning process. These alternatives included the use of other modes of transportation and the use of other airports in the region. Discussions regarding the evaluation of these alternatives can be found in the FEA, Section 2.5 .

CONCLUSION

Based on the information disclosed in the FEA, the FAA has determined that the Propose Action (Alternative 2) demonstrates the best ability to meet the purpose and need of the project with the least adverse environmental impact. Therefore, the Propose Action (Alternative2) has been determined by the FAA in this FONSI/ROD to be the FAA's preferred alternative. This alternative directly supports the essential and most urgent operational needs for the Los Angeles ARTCC and the Las Vegas TRACON, with the least adverse environmental effects. In arriving at the decision, the FAA considered all pertinent factors including the environmental impacts as well as the FAA statutory charter in the Federal Aviation Act of 1958, as amended to encourage and foster the development of civil aeronautics (49 U.S.C. 40101).

IV. ENVIRONMENTAL CONSEQUENCES AND MITIGATION

Since the majority of the Las Vegas Four Corner-Post Plan involves aircraft route changes at altitudes above 3,000 feet, and does not involve any physical construction activities, many of the environmental impact categories required by FAA Order 1050.1D, *Policies and Procedures for Considering Environmental Impacts,* would not be affected. For example, the proposed procedures would not impact environmental factors relating to the physical environment (water quality, biotic communities, endangered and threatened species of fauna and flora, wetlands, floodplains, coastal zone management, coastal barriers, wild and scenic rivers, or farmlands). Likewise, the proposed procedures do not have any physical construction issues, so construction impacts such as (energy supply and natural resources, light emissions, solid waste, or construction) were not necessary to evaluate. As stated in the FEA, Section 4.1.1, *Additional Environmental Consequences Not Evaluated,* the following additional environmental consequences are briefly discussed why they were not evaluated:

Air Quality
The air quality of one's environment and the resultant emissions generated from various transportation modes are always a concern of the general public. It must be emphasized that the implementation of the Las Vegas Four Corner-Post Plan would not increase the number of flights within the Las Vegas metropolitan area. Therefore, the

existing pollutant levels, or air emissions due to operations of aircraft will not increase as a result of the proposed project.

Compatible Land Use
FAA Order 1050.1D, Attachment 2, Paragraph 3 states that "the compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of noise impacts related to that airport." Potential noise impact areas were applied to city and county land use and zoning maps for a determination of compatibility. Additionally, the noise analysis described in the FEA, Section 4.2, *Noise,* concluded that there were no significant impacts. Therefore, no analysis was conducted for land use compatibility issues.

Social Impacts
Social impacts associated with air traffic procedural changes are not generally related to the relocation of homeowners, businesses, or other community disruption that may be caused by related construction or land acquisition activities. The proposed project would not disrupt or involve property acquisition, construction, disrupt the pattern of local land uses, or alter surface transportation patterns. Additionally, noise impacts are negligible; therefore, there was no need for an analysis of this impact category.

Induced Socioeconomic Impacts
Implementation of the proposed project would not result in shifts in patterns of population movement and growth, public service demands, or change in business and economic activity. Therefore, this impact category was not studied.

Environmental Justice
In response to Executive Order 12898, the proposed project would not acquire land, displace people, or impact noise upon low-income or minority populations. Minority population areas are defined as areas exceeding 50 percent of the general population. Low-income is determined based upon median household income being at or below poverty level. Neither of these conditions were representative of the areas affected by the proposed project.

Potential Impacts of the Proposed Action
The Las Vegas Four Corner-Post Plan only has the potential to impact the following resource categories:

- **Noise** – The change in aircraft routes has the potential to expose certain areas that have not experienced noise in the past.

- **Department of Transportation 4(f)** – The potential noise and visual impacts may disrupt parks, recreation areas, wildlife and waterfowl areas, and historic structures.

- **Historic, Architectural, Archeological and Cultural** – The potential noise and visual impacts to Section 106 lands.

- **Visual** – The potential for visual impacts to adversely effect Section 106 lands.

NOISE

Noise has become the greatest environmental consequence of having an airport in a community. Departure noise is generally far greater than arrival noise because aircraft engines are operating at full engine thrust. Existing departure procedures at LAS dictate that departing aircraft make right turns over the city of Las Vegas, and other populated areas. If demand at LAS grew as forecasted, and the existing approach and departure procedures were not modified, those communities over-flown by aircraft today would likely experience an increase in aircraft noise exposure over time.

For this EA, the Proposed Action condition was assessed for both 2000 and 2005 conditions. The findings indicate that although aircraft noise levels would increase at some locations, the significant noise increase (1.5 dB within the 65 DNL over non-compatible land use) would be temporary in nature (2000 condition only) and would be mitigated through the implementation of the Proposed Action over time. Therefore no further mitigation would be required.

DEPARTMENT OF TRANSPORTATION, 4(f)

The Proposed Action procedures, do overfly national and state parks; i.e., the BEATY STAR is over the Floyd Lamb State Park and the FUZZY 5 STAR is over the Humbolt Toiabe National Park. However, the proposed procedures are not increasing the area exposed from the existing conditions or adding additional areas. Additionally, the Proposed Action does not "take or use" publicly owned land, therefore, No adverse impacts would result, and no mitigation measures are required.

HISTORIC, ARCHITECTURAL, ARCHEOLOGICAL AND CULTURAL RESOURCES

The State Historic Preservation Officer (SHPO) was notified of the Proposed Action by receipt of the scoping memo, “Notice of the Proposed Action and Preparation of Environmental Assessment for the Las Vegas Four Corner-post Project,” dated January 26, 2001. In accordance with 36 CFR Part 800.4(d)(1), the FAA, as Lead Agency, forwarded its determination of no effect letter to the SHPO on May 21, 2001. No comments were received from the SHPO. Therefore, the Lead Agency’s responsibilities under Section 106 are fulfilled.

As the existing No Action procedures do, the Proposed Action procedures will also overfly Native American Reservations. The Las Vegas Colony Reservation is overflown by the STAAV DP and the BEATY STAR. The STAAV DP also over flies the Moapa Reservation. Because the Proposed Action utilizes existing flight paths over the Las Vegas Colony, no adverse impacts would result and no mitigation measures are required.

VISUAL IMPACTS

Under the Proposed Action no adverse impacts would result and no mitigation measures are required. The impact that would potentially occur does not linger in the

area and is not permanent or impairment, but the potential disruption could have a diminishing effect on the natural area.

CUMULATIVE IMPACTS

The combination of the development of Ivanpah Valley Airport, the LAS Airport Capital Improvement Program projects, and the Proposed Action of the Las Vegas Four Corner-Post Plan would likely reduce the percentage of flights over the urban areas of the Las Vegas valley while increasing the percentage of flights over the Ivanpah area. Beyond this, there would be no additional impacts beyond those disclosed in the FEA.

V. PUBLIC AND AGENCY INVOLVEMENT

Notice of the Proposed Action

On January 26, 2001, the FAA's Western-Pacific Region issued a Notice of Proposed Action for the preparation of this EA.

Notice of Availability of the Draft EA

In March 2001, a legal notice appeared in the Las Vegas Review Journal (4/14 – 4/15) and the Las Vegas Sun (4/14 – 4/15) announcing the availability of the Draft EA.

On March 20, 2000, copies of the Draft EA were sent to the same distribution list that received the scoping notice. Nineteen libraries throughout the Las Vegas area received copies of the Draft EA and the document was made available at the FAA Western-Pacific Region web site.

Notice of Public Information Meetings

On April 14, 15, 30 and May 1, 2001, a legal notice appeared in the Las Vegas Review-Journal and the Las Vegas Sun announcing the location and times for the public information meetings. The purpose of these public information meetings were to explain the proposed project and take comments on the Draft EA. The four public information meetings were held on April 30th, May 1st , May 2nd, and 3rd 2001. The times and locations of the public information meetings are as follows:

- April 30, 2001: Boulder City, NV at Community College of Southern Nevada (Boulder City Campus) 6:00 – 8:00 p.m.
- May 1, 2001: Henderson, NV at Community College of Southern Nevada (Henderson Campus) 6:00 – 8:00 p.m.
- May 2, 2001: Spanish Trails, NV at Grant Sawyer Middle School 6:00 – 8:00 p.m.
- May 3, 2001: North Las Vegas, Reynaldo Martinez Elementary School 6:00 – 8:00 p.m.

Notice of Availability of the Final EA

Upon signature of this FONSI/ROD, a legal notice will appear in the Las Vegas Review Journal and the Las Vegas Sun announcing the FAA's decision and the availability of the Final EA. Also, a Notice of Availability will be sent to each of the people and agencies that commented on the Draft EA, including responses to e-mail messages.

Copies of the Final EA will be sent to everyone who received a Draft EA, plus anyone requesting a copy. Nineteen libraries throughout the Las Vegas area will receive copies of the Final EA.

VI. INTERAGENCY COORDINATION

Interagency coordination was accomplished during the preparation of the EA. Agencies consulted included the U.S. Environmental Protection Agency, the State Office of Historic Preservation, the U.S. Fish and Wildlife Service, the Las Vegas Colony and the Moapa Band of the Paiute Native American Reservations. Other Federal, State and local governmental agencies were included with the distribution of the Draft EA. Refer to Appendix E of the FEA for a complete distribution list.

VIII. POLICY CONSIDERATIONS

In the consideration of alternatives, the FAA has been mindful of its statutory charter to encourage and foster the development of civil aeronautics and air commerce in the United States (49 U.S.C. 40104). This project will enhance air traffic safety and efficiency.

The project is subject to the provisions of the National Environmental Policy Act (NEPA) of 1969, as amended. NEPA is intended to insure that the federal agencies make decisions with full knowledge of environmental consequences of such actions. The Environmental Assessment (EA) was performed in accordance with DOT Order 5610.1, *Procedures for Considering Environmental Impacts,* and FAA Order 1050.1D, *Policies and Procedures for Considering Environmental Impacts*.

IX. PROPOSED AGENCY ACTIONS

The FAA recognizes its environmental responsibility under NEPA, Council of Environmental Quality (CEQ) regulations, and its own directives. The FAA also has the responsibility to enhance, develop, and improve the safety, efficiency, and utility of the National Airspace System, including the establishment of navigational facilities on the airports.

The proposed Federal Action being considered by this EA includes the modification of air traffic procedures within the boundaries of the Los Angeles ARTCC and the Las Vegas TRACON. Additionally, the Las Vegas Four Corner-Post Plan will increase the Las Vegas TRACON ceiling from 15,000 feet MSL to Flight Level 190 (19,000) feet MSL. More specifically, the modifications to air traffic procedures would include:

Arrivals

- The FUZZY 4 STAR would be modified and renamed the FUZZY 5 STAR
- The location of the NOOTN STAR would be modified and renamed the LUXOR STAR
- The location of the CRESO STAR would be modified and renamed the CLARR STAR
- The location of the PEACH SPRINGS STAR would be modified and renamed the MIROK STAR

The addition of the following RNAVs include:

- LYNSY, SKEBR, TRAGR, KSINO and the BEATY

Departures

- The location of the OVETO DP would be modified and renamed the LAS VEGAS DP
- The location of the MEAD DP would be modified and renamed the HOOVER DP
- The location of the OASYS DP and the REDROCK DP would be combined, modified and renamed the MCCARRAN DP

The addition of the following RNAVs include:

- IDALE, WYLDD, STAAV, MINEY, and AACES

X. AGENCY FINDINGS

The Las Vegas Four Corner-Post Plan is consistent with the FAA's directives and will not significantly affect the quality of the human environment. The FAA is authorized to establish and improve air navigation facilities wherever necessary for increased safety (49 U.S.C. 44502(a)(1)(A)).

This Las Vegas Four Corner-Post Plan will ensure safe and efficient travel of aircraft utilizing McCarran International Airport. Fair consideration has been given to the interests of communities in or near the project location (49 U.S.C. 47106(b)(2)) and ensuring environmental justice (EO 12898).

Based on the EA, that was prepared, this combined Finding of No Significant Impact and Record of Decision has been issued. The EA is hereby incorporated into this decision.

XI. DECISIONS AND ORDERS

The FAA recognized its responsibilities under NEPA, CEQ regulations and its own directives. Recognizing these responsibilities, the FAA has carefully considered the objectives of the Las Vegas Four Corner-Post Plan in relation to aeronautical and environmental factors at and around McCarran International Airport. Based upon the

above analysis, the FAA has determined that the Proposed Action (Alternative 2), which includes the implementation of the route changes in the Las Vegas Four Corner-Post Plan, is both the technically and environmentally preferred alternative.

This document, along with the FEA, constitutes an assessment for the environmental consequences implement the proposed route changes. The undersigned finds that the proposed federal action is consistent with the National Environmental Policy Act of 1969 and will not significantly affect the quality of the human environment or otherwise include any condition requiring further consultation pursuant to Section 102(2)(c) of NEPA. Further environmental study is not required.

Having carefully considered the aviation safety and operational objectives of the project, as well as being properly advised as to the anticipated environmental impacts of the proposal, under the authority delegated to me by the Administrator of the FAA, I find that the project is reasonably supported, and I therefore, direct this action be implemented.

This decision constitutes final agency action under 49 U.S.C. §46110(a), for the Las Vegas Four Corner-Post Plan. Any party to this proceeding having substantial interest may apply for review of the decision by filing a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit or the court of appeals for the U.S. for the circuit in which the person resides or has its principal place of business. The petition must be filed not later than 60 days after the decision is issued.

Approved: J. Clancy Date: June 26, 2001

John Clancy
Manager, Air Traffic Division
Western-Pacific Region

TABLE OF CONTENTS

Page

TABLE OF CONTENTS
(Continued)

Page

LIST OF TABLES

Page

LIST OF EXHIBITS

Page

CHAPTER ONE
PURPOSE AND NEED

1.1 PURPOSE OF THE ENVIRONMENTAL ASSESSMENT

The Federal Aviation Administration (FAA) has proposed various flight procedural changes within the Los Angeles Air Traffic Control Center (ARTCC) and the Las Vegas Terminal Radar Approach Control (TRACON) boundaries to increase safety, efficiency and ultimately reduce delays. As a result of these proposed changes, the FAA prepared this Environmental Assessment (EA) to study possible impacts and address community concerns. The consulting firm of Landrum & Brown was retained to conduct this environmental study.

This EA is being prepared for the Proposed Action because it may have potential minor or uncertain environmental impacts. An EA requires analysis and documentation similar to that of an Environmental Impact Statement (EIS), but with less detail and coordination. Depending upon whether certain environmental thresholds of significance are exceeded or not, an EA will either lead to a Finding of No Significant Impact (FONSI) or to the requirement for the preparation of an EIS.

The Final EA will be used by the appropriate decision-makers in their determination to approve or disapprove the Proposed Action. The document is made available for review and comment as part of the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C., § 432 et seq.).

1.2 GENERAL INFORMATION ABOUT THE DOCUMENT

The format and content of the EA conforms to the requirements set forth in the President's Council on Environmental Quality (CEQ) regulations that implement the procedural provisions of NEPA (Title 40, CFR 1500-1508); and the U.S Department of Transportation (DOT) Federal Aviation Administration (FAA) implementing requirements as contained in DOT Order 5610.1C, *Procedures for Considering Environmental Impacts,* and in FAA Order 1050.1D, *Policies and Procedures for Considering Environmental Impacts*

In keeping with NEPA, DOT, and FAA guidelines, this document consists of five main chapters. The format and content of these chapters are summarized as follows:

> Chapter 1 – Purpose and Need includes a description of the general environmental regulations with which this EA is to be prepared, background information, the purpose and need of the project, and a detailed description of the Proposed Action.

Chapter 2 – Alternatives contains a review of the possible alternatives evaluated as part of EA analysis, including the Proposed Action and the No Action Alternatives. This chapter summarizes in comparative form the environmental consequence associated with each alternative considered.

Chapter 3 – Affected Environment provides a description of the natural and human environment that serves as a general setting for the Proposed Action and the No Action Alternative.

Chapter 4 – Environmental Consequences details specific potential environmental impacts of the Proposed Action and the No Action Alternative on the environment.

Chapter 5 – List of Preparers contains a list of the persons contacted and the list of those who contributed to the preparation of the EA.

Appendices contain technical analysis used in the development of the document including *Noise* (Appendix A), *Response to the Draft EA* (Appendix B), *Coordination/Public Involvement* (Appendix C), *Responses to the Notice of Proposed Action* (Appendix D), and the *Distribution List* (Appendix E).

1.3 PROPOSED FEDERAL ACTION

The proposed Federal Action being considered by this EA includes the modification of air traffic procedures within the boundaries of the Las Vegas TRACON and increasing the Las Vegas TRACON ceiling from 15,000 feet MSL to Flight Level 190 (19,000 feet MSL) as recommended in the Las Vegas Four Corner-Post Plan. More specifically, the modifications to air traffic procedures would include:

Arrivals

- The FUZZY 4 STAR would be modified and renamed the FUZZY 5 STAR
- The location of the NOOTN STAR would be modified and renamed the LUXOR STAR
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The addition of the following RNAVs include:

- IDALE, WYLDD, STAAV, MINEY, and AACES

Section 1.5, *Existing Air Traffic Control Procedures,* provides descriptions of the existing air traffic control procedures along with the technical terms and acronyms that are used throughout this document.

1.4 BACKGROUND

The following section provides background information regarding the basic organization of the nation's air traffic control system including a discussion of airspace and air traffic control responsibilities. Information related to the existing air traffic procedures in the Las Vegas TRACON is also provided.

1.4.1 National Airspace Redesign

National Airspace Redesign (NAR) is a long-term project managed by the FAA's Air Traffic Airspace Management Office (ATA). NAR is tasked with evaluating the air traffic environment in the National Airspace System (NAS). In evaluating the air traffic environment, NAR will develop a strategy that will increase system capacity while maintaining the highest standards of safety, improve flexibility and predictability, and decrease delays. Historically, the responsibility for airspace management has resided with FAA regional offices and the responsibility for operational considerations within individual air traffic control facilities. National Airspace Redesign asserts an entire airspace system approach rather than incremental changes that are local in scope, and centered on single areas of airspace concern. This is to be accomplished by a "top down" method, which means designing the most efficient enroute system possible and then developing routes to and from the terminal areas to complement the new enroute environment.

1.4.2 Airspace

Airspace in the United States is classified generally as controlled, uncontrolled, or special use. Controlled airspace encompasses those areas where there are specific certification, communication, and navigation equipment requirements that pilots and aircraft must meet to operate in that airspace. Controlled airspace, shown on **Exhibit 1-1**, is classified as either Class A, B, C, D, E, or Special Use Airspace (SUA).

The following list describes the various boundaries and requirements of each class of airspace.

- **Class A** – This is designated for positive control of the aircraft. The area of airspace ranges from 18,000 feet above mean sea level (MSL) to 60,000 feet above MSL. Within Class A airspace, only Instrument Flight Rules (IFR)[1] operations are authorized. The aircraft must have specific equipment and an air traffic control clearance before entering the airspace.
- **Class B** – This is multi-layered airspace from the surface of the earth up to 10,000 feet MSL. It is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for turbo jet aircraft at major airports. The aircraft must have specific equipment and an air traffic control clearance before entering the airspace.
- **Class C** – This airspace is defined around airports with airport traffic control towers and radar approach control facilities. The top of Class C airspace is normally 4,000 feet above ground level (AGL). The aircraft must have specific equipment and must have established communications with the air traffic control facility having jurisdiction over the airspace before entering the airspace.
- **Class D** – This airspace is normally a circular area with a radius of four to five nautical miles (NM) around the primary airport and any extensions necessary to include instrument approach and departure paths.
- **Class E** – This is a general category that contains controlled airspace previously designated as control zones for non-towered airports, airspace transition areas, and Federal airways
- **Special Use Airspace (SUA)** – An area wherein activities must be confined because of their nature, or wherein limitations are imposed on aircraft operations not part of those activities. Special Use Airspace is generally classified as a Restricted (R), Prohibited, or Military Operations Area (MOA). Special Use Airspace is shown in **Exhibit 1-2**.
- **Class G** – Airspace not designated as either Class A, B, C, D, E, or SUA is considered uncontrolled and is classified as Class G.

[1] IFR refers to procedures used by pilots when operating in accordance with Federal Air Regulations (FARs) that require an instrument flight plan.

Click here for Exhibit 1-1

Click here for Exhibit 1-2

Special Use Airspace

1.4.3 Air Traffic Control

FAA Order 7110.65, *Air Traffic Control*, establishes that the purpose of the air traffic control (ATC) system is safety. It further states, "the primary purpose of the ATC system is to prevent a collision between aircraft operating in the system and to organize and expedite the flow of traffic." Air traffic control is the means by which aircraft are Insert Exhibit 1-2 directed and separated within controlled airspace. Air traffic control (within the confines of this study) is managed by three different FAA facilities depending on where the aircraft is located within the airspace.

These three facilities are the Las Vegas Air Traffic Control Tower (ATCT), Las Vegas Terminal Radar Approach Control (TRACON), and Los Angeles Air Route Traffic Control Center (ARTCC).

Air traffic control responsibility for an IFR aircraft departing an airport begins on the ground with the ATCT. Aircraft are directed to the active runway and provided initial departure instructions. As the aircraft departs, control is transferred to the TRACON. The TRACON manages the aircraft until it leaves the terminal area, which is the specific altitude or geographical boundary of the TRACON facility. Once the aircraft is beyond the terminal area, control transfers to an ARTCC. An arriving aircraft uses these same air traffic facilities, but in the reverse order (ARTCC to TRACON to ATCT). **Exhibit 1-3** depicts how aircraft transition through the various air traffic control facilities. The following sections discuss the air traffic control facilities affected by the changes proposed by the Las Vegas Four Corner-Post Plan: Los Angeles ARTCC, the Las Vegas TRACON, and the ATCT at McCarran International Airport (LAS).

Los Angeles ARTCC

The Los Angeles ARTCC is one of twenty ARTCC facilities in the United States that controls air traffic from the surface to the highest altitudes of aircraft operation. Within the ARTCC boundary are smaller geographical and vertical blocks of airspace called sectors. Low-altitude sectors control aircraft generally from the surface to 23,000 feet MSL, while high-altitude sectors control aircraft generally above 23,000 feet MSL. Frequently, there are ultra high-altitude sectors to control aircraft operating above the high-altitude sectors. Aircraft arriving or departing Las Vegas TRACON Airspace are controlled within the low, high, and ultra high-altitude sectors of a geographic area within the Los Angeles ARTCC referred to as Area D and Area F, shown on **Exhibit 1-4**.

Click here for Exhibit 1-3

How Aircraft Transition

Click here for Exhibit 1-4

Los Angeles ARTCC Boundary

Las Vegas TRACON

Airspace in the vicinity of airports is delegated to a TRACON facility. The Las Vegas TRACON, as shown on **Exhibit 1-5,** is responsible for aircraft landing and departing at LAS and at a number of smaller satellite[2] airports within a 40 NM radius of LAS and up to an altitude of 15,000 feet MSL. Within the TRACON boundary the airspace is further divided into smaller geographic sectors within which specific routes are assigned to effectively control aircraft.

Las Vegas ATCT

The Las Vegas ATCT is responsible for aircraft as they taxi to and from runways. In addition, they authorize aircraft to land or takeoff. The Las Vegas ATCT is also responsible for controlling vehicles on the airport's taxiways, and runways. The Las Vegas ATCT controls aircraft within an approximately five NM radius around the airport from the surface to approximately 3,000 feet MSL.

1.4.4 Air Traffic Controllers

Air traffic controllers efficiently manage aircraft to ensure the safe and orderly flow of aircraft to and from airports. They issue control instructions, establish appropriate aircraft sequencing, and closely monitor the air traffic flow to ensure a safe distance between each aircraft while minimizing delay. Additionally, air traffic controllers keep pilots informed of changing weather conditions, which may impact the safety of flight; the availability of airspace; and the direction of traffic flows (take-off and landing) at the airport.

The complexity of the air traffic controller's task is directly related to the number of aircraft simultaneously flying in an air traffic control sector, the geometry of flight routes, weather, and terrain. Increases in air traffic volume combined with complex route geometry will lead to increases in the demand placed upon controllers. Once the human performance limits of an air traffic controller are reached, the air traffic controller responds by limiting the number of aircraft actively flying in the sector. The controller limits activity by increasing the minimum distance (or time) separation between aircraft entering the sector on some or all routes in that sector. When a controller increases the separation required between planes along a route, that route's capacity is reduced. Reducing capacity along highly utilized routes may increase delays for aircraft using the route.

[2] Satellite airports are general aviation airports that service civil general aircraft operations and provide relief to major airports.

Click here for Exhibit 1-5

TRACON boundary

1.5 EXISTING AIR TRAFFIC CONTROL PROCEDURES

The current air traffic control procedures in the Las Vegas TRACON are based on an aircraft direction-based system – referred to as an East Corner-Post system. This direction-based system helps to organize aircraft arriving from and departing to similar directions over a specific geographic position (referred to as fix). The location of a fix is defined for pilots and controllers by the location of a radio navigation aid or determined by reference to one or more radio navigation aids.

McCarran International Airport has four runways. There are two sets of parallel runways. One set is oriented east-west (Runways 7L/R-25L/R) while the other set is oriented north-south (Runways 1L/R-19L/R). The airport operates in four configurations. Configuration 1, (the primary configuration) operates in a south/west flow, with arrivals to both 19L/R and 25L/R and departures from both 19L/R and 25L/R. The other three configurations are Configurations 2, 3, and 4. In Configuration 2, aircraft depart east (runway 7L). Air carrier turbojet aircraft only depart Runway 7R when dictated by weather or when Runway 7L is closed. In this configuration aircraft arrive and depart on Runways 1L/R. In Configuration 3, aircraft arrive from the south (runway 1L/R) and from the east (runway 25L/R), and depart north (runway 1L/R). In Configuration 4, all arrivals and departures use runway 7L/R. Please refer to **Table 1-1** for the Average Runway Use Percentage.

Runway use at McCarran International Airport is determined by the prevailing winds in the Las Vegas valley. Table 1-1 depicts the average annual runway use by air carrier turbojet arrivals and departures. It is readily discernable that 55-60 percent of all air carrier jet arrivals and departures occur to the west on Runways 25R and 25L. The remaining 40-45 percent of air carrier arrivals and departures occur on Runways 1L and 1R (to the north) or Runways 19L and 19R to the south. Less than 2 percent of the turbojet air carrier operations occur on Runways 7.

Table 1-1
AVERAGE RUNWAY USE PERCENTAGE FOR
McCarran International Airport

Average Runway Use Percentage				
	Air Carrier Jet		Commuter/GA	
Runway	**Arrivals**	**Departures**	**Arrivals**	**Departures**
01L	15.3	1.6	17.1	14.2
01R	1.7	18	4.8	6.6
19L	1.5	21.6	16.2	23.4
19R	22.3	1.5	57.8	50.5
07L	0.1	1.7	0.1	2.2
07R	0.9	0	0.9	0.1
25L	56.6	1.5	1.5	0.7
25R	1.6	54.1	1.6	2.3
Total	**100%**	**100%**	**100%**	**100%**

Source: Federal Aviation Administration LAS ATCT

Aircraft arriving or departing LAS under IFR operations use approach and departure procedure charts for navigation guidance. Aircraft arriving at LAS follow one of the published Standard Terminal Arrival Routes (STAR) developed for the airport, while departing aircraft follow one of the published Departure Procedures (DP) developed for the airport. The STAR and DP procedures are defined by a series of fixes (geographical positions). A STAR procedure facilitates transition between enroute and terminal airspace. The procedure ends when it joins a published approach,[3] or places an aircraft in position to continue to the landing runway for the destination airport. A DP facilitates transition between terminal airspace and enroute operations. The procedure ends when the aircraft is established on its assigned route to the destination airport.

Table 1-2, lists the existing STAR and DP procedures published for LAS, the direction aircraft are flying to or from, and the Los Angeles ARTCC Sector responsible for aircraft on each route.

Table 1-2
EXISTING PROCEDURES
McCarran International Airport

Existing Procedure	Direction	Responsible ARTCC Sector
Arrivals		
FUZZY 4 STAR	N, NW	16
NOOTN STAR	N, NE	7
CRESO STAR	S, SW	6
PEACH SPRINGS STAR	S, SE	8
CROWE STAR (INACTIVE)	*	*
VEEVA STAR (INACTIVE)	*	*
Departures		
OVETO DP	N, NE	7
MEAD DP	SE	8
REDROCK DP	SW, NW	6,16
OASYS DP	SW, NW	6,16
EBERT DP (INACTIVE)	*	*

* Note: These STAR and DP procedures are defined but not currently in use.

[3] A published approach to an airport is a chart that provides instruction on how to navigate from flight to the runway surface using a specific navigation aid or RNAV capabilities.

1.5.1 Satellite Airports

Satellite airports provide facilities and services for general aviation aircraft and serve as reliever airports to the major airports in their metropolitan area. The Las Vegas metropolitan area has four satellite airports, North Las Vegas, Henderson Executive Airport, Jean Airport, and Boulder City Airport. The location of these airports is depicted in this document in Chapter 3, *Affected Environment*. Satellite airports, like major airports, publish STAR and DP procedures to facilitate IFR traffic. Not all satellite airports have published instrument procedures (STARs and DPs). Henderson Executive Airport, for example, does not have published instrument procedures, therefore routes to and from this airport are not considered in this EA. **Table 1-3** lists the existing satellite procedures.

Table 1-3
EXISTING SATELLITE AIRPORT PROCEDURES

Existing Procedure	Satellite Airport Served	Responsible ARTCC Sector
Departures		
NOTOWN DP	VGT	6,7,8, and 16

1.5.2 Helicopter Operations

This Draft EA does not address helicopter operations because there are no proposed changes to the existing helicopter procedures. The existing helicopter procedures do not impact the proposed Four Corner-Post Plan.

1.6 CONFLICTS WITHIN EXISTING PROCEDURES

Some of the existing STAR and DP procedures for LAS create inefficiencies within Las Vegas TRACON airspace, and the Los Angeles ARTCC airspace. These inefficiencies have become more pronounced as traffic volume at LAS has increased. Airspace inefficiencies in the Las Vegas TRACON are created because the existing approach and departure procedures use the same flight path corridors to the northeast, northwest, southeast, and southwest. This results in departing aircraft not being able to climb unrestricted and arriving aircraft being restricted to higher altitudes.

McCarran International Airport is located approximately eight miles south of Nellis Air Force Base. As a result, substantial coordination is required between the Las Vegas TRACON and Nellis Air Traffic Control Facility. The Las Vegas TRACON airspace is further complicated by SUA, and high terrain north, west, and south of the airport.

The existing Las Vegas TRACON airspace requires high attention by the air traffic controller to monitor assigned altitudes, ensure safe separation, and ensure aircraft remain within designated TRACON airspace. The following paragraphs describe the conflicts that exist with each procedure. Refer to the **Exhibit 1-6 and Exhibit 1-7** that highlight the existing conflicts at LAS.

OVETO DP/NOOTN STAR: The OVETO DP requires aircraft departing Runway 19 or Runway 25 make a right turn over densely populated urban areas of the Las Vegas valley and cross the NOOTN STAR. Because these opposing flight paths cross each other, aircraft are given altitude restrictions resulting in additional controller coordination, increased flight time, fuel burn, and exposing communities to aircraft overflights.

MEAD DP/PEACH SPRINGS STAR: Aircraft using the MEAD DP make a right turn after departing Runway 19 and Runway 25 over densely populated urban areas of the Las Vegas valley and cross the PEACH SPRINGS STAR (Refer to Conflict Exhibits). Because these opposing flight paths cross each other, aircraft are given altitude restrictions resulting in additional controller coordination, increased flight time, fuel burn, and exposing communities to aircraft overflights.

All of the above procedures are restricted to a narrow corridor 4.8 NM wide, between Las Vegas TRACON airspace and Nellis Air Traffic Control Facility. Air traffic controllers must ensure departing aircraft do not violate this military airspace, which requires additional controller coordination between Las Vegas TRACON and Nellis Air Traffic Control Facility.

OASYS DP and REDROCK DP/FUZZY STAR: The OASYS DP and the REDROCK DP cross the FUZZY STAR. Because these opposing flight paths cross each other, aircraft are given altitude restrictions resulting in additional controller coordination, increased flight time, fuel burn, and exposing communities to aircraft overflights.

1.7 AIRSPACE LIMITATIONS

1.7.1 Limitations Imposed by Las Vegas TRACON Airspace Ceiling

The existing Las Vegas TRACON airspace ceiling is 15,000 feet MSL. Because a transfer of air traffic control must be made from the TRACON facility to the ARTCC facility, departing aircraft are given an altitude restriction of 15,000 feet MSL. This altitude restriction imposes operating constraints on aircraft, increasing flight time and fuel burn for the aircraft.

Click here for Exhibit 1-6

Conflict Exhibit

Click here for Exhibit 1-7

Conflict Exhibit

1.7.2 Limitations Imposed by Noise Abatement Procedures

The Las Vegas TRACON is adversely impacted by the existing noise abatement procedures defined for LAS. McCarran International Airport has stringent noise abatement procedures that restrict the airport from the full advantages of air traffic control. These restrictions include curfew hours placed on specific departure runways and limits to the number of aircraft operations on assigned runways. While none of these restrictions are onerous, they can be capacity limiting in certain conditions. The following describe the limitations imposed on each runway at LAS by the noise abatement procedures.

Runway 1L/R: Turbojet operations over 75,000 lbs. are prohibited during noise sensitive hours (8 p.m. to 8 a.m.) unless wind or weather conditions dictate otherwise.

Runway 7R: Turbojet departures are prohibited unless Runway 7L is closed.

Runway 7L/R: Turbojet departures fly runway heading until reaching 7 DME, then proceed on course.

Runway 19L/R: Turbojet operations over 75,000 lbs. are prohibited during noise sensitive hours (8 p.m. to 8 a.m.) unless wind or weather conditions dictate otherwise.

Runway 25L/R: Turbojet departures fly runway heading until reaching 3 DME, then turn southwest.

1.7.3 Limitations Imposed by Special Use Airspace (SUA)

Large expanses of Special Use Airspace (SUA) have been created in the western United States during the past several decades. Much of this airspace is in close proximity to the Las Vegas TRACON. The SUA includes Military Operations Areas (MOA) and restricted areas within which the military conducts training and other activities to complete their National defense mission. The existence of the SUA has the affect of funneling aircraft through relatively narrow routes to and from the Las Vegas TRACON. Its location greatly reduces the operational flexibility of both Las Vegas TRACON and Los Angeles ARTCC to manage the large increases in traffic that has occurred in recent years. Restricted Areas and MOAs located on all sides of the Las Vegas TRACON impact approach, departure, and enroute airway development. Please refer to Exhibit 1-2 for an understanding of these SUA areas and the restrictions they encumber upon air traffic procedures in and out of the Las Vegas area.

1.8 AIR TRAFFIC MANAGEMENT STRATEGIES THAT RESOLVE CONFLICTS AT ROUTE INTERSECTIONS

Air traffic controllers generally employ two strategies to manage air traffic at route intersections. They will either segregate aircraft to separate altitudes (dynamic altitude restrictions) and enforce level flight at the intersection, or they will re-route traffic from one route to another so the remaining traffic can flow through the airspace with increased safe separation. The increased separation gives the controller enough time between successive aircraft to coordinate air traffic. The implications of using each of these strategies to resolve route conflicts are discussed below:

1.8.1 Imposing Altitude Restrictions at Route Intersections

Altitude restrictions are placed on aircraft when one flight route intersects another to ensure safe separation between aircraft. Altitude restrictions impact the overall efficiency of the airspace by increasing the coordination between pilots and air traffic controllers. Altitude restrictions affect controller utilization and aircraft operating efficiency, and may contribute to delays. An altitude restriction requires communicating a clearance to a pilot, except when published and charted, and receiving a confirmation of compliance from the pilot. The more altitude restrictions given, the higher the demand placed upon the controller and pilot.

Altitude restrictions also impact the sequencing of aircraft, which must be done farther from the destination airport to ensure safe separation between aircraft. More sequencing requirements often rely on holding or the issuance of radar vectors (controller assigned directional headings) to arriving aircraft. More sequencing also means more in-trail separation for departing aircraft. This may increase aircraft delays as aircraft wait on the ground for a departure clearance. Altitude restrictions may create longer travel times and increased fuel burn for aircraft operators. Greater sequencing, holding, radar vectoring, or in-trail separation can also mean increased delays. This complexity reduces the overall efficiency of the airspace.

1.8.2 Aircraft Re-routing

When a flight route is over-crowded, air traffic controllers often re-route aircraft to another route to relieve congestion, provided alternative routes are available. Re-routing of aircraft, as with altitude restrictions, increases delay and overall airspace efficiency. Moving aircraft from one route to another involves a clearance that requires a confirmation of compliance from the pilot. Additional clearances place additional demand upon controllers and pilots.

Re-routing aircraft also increases the need for coordination between controllers as one controller needs to obtain approval from another controller prior to entering their control area. Re-routing can also be detrimental to an aircraft operator by increasing travel time, fuel consumption, and at times inducing a traffic delay. This complexity also reduces the overall efficiency of the airspace.

1.9 DESCRIPTION OF THE PROPOSED ACTION

The existing structure of the Las Vegas TRACON is an East Corner-Post system. The East Corner-Post system was created to solve an aircraft sequencing problem that was occurring within Los Angeles ARTCC. Prior to establishing the East Corner-Post project in 1998, LAS east arrivals were using a single arrival procedure called the CROWE STAR. Because there were two arrival flows from the east, Los Angeles ARTCC Sectors 7 and 8 had to merge these two traffic flows into a single flow approximately 75 miles from the airport, below 15,000 feet MSL, and at 250 nautical miles per hour (knots). At the same time, Sectors 7 and 8 were also responsible for sequencing and controlling military aircraft en route to Nellis Air Force Base. The East Corner-Post system created the NOOTN STAR and PEACH SPRINGS STAR so that aircraft arriving from two separate traffic streams would not have to be sequenced into one in Los Angeles ARTCC airspace. This alleviated the aircraft sequencing issue for Los Angeles ARTCC controllers in Sectors 7 and 8 while enhancing the general flow of traffic in the LAS terminal area.

The East Corner-Post system has only been an interim step to solving the greater airspace inefficiencies within Las Vegas TRACON and Los Angeles ARTCC. Thorough review of the existing approach and departure procedures at Las Vegas in today's high demand environment has determined that the Las Vegas TRACON airspace needs to develop a Four Corner-Post system.

The proposed Four Corner-Post system is also a direction-based system that organizes aircraft from similar directions over a specific geographic position (referred to as fix). The proposed Four Corner-Post system however, further organizes aircraft so that aircraft arriving from similar directions are directed over a specific fix and aircraft departing to similar directions are directed over a different fix. This separates arrival traffic from departure traffic eliminating the need for altitude restrictions. The location of a fix is defined for pilots and controllers, in Classic procedures, by the location of a radio navigation aid or determined by reference to one or more radio navigation aids. Aircraft operating with advanced navigation equipment utilize RNAV procedures with fixes defined by earth-based coordinates (latitude and longitude).

As mentioned previously in this chapter, National Airspace Redesign (NAR) is a growing initiative to allow for more efficient air traffic management. NAR has recognized the Four Corner-Post Plan as following its strategy of creating a more efficient airspace environment; one that will enable aircraft to enter enroute and TRACON airspace more efficiently. This recognition has given the Four Corner-Post Plan national support, and the funding needed to see the project through to implementation.

1.9.1 Proposed Arrival and Departure Procedures

Historically, STAR and DP procedures have been designed and published as "classic" procedures. Classic procedures are developed using ground-based navigation aids. Recently, the FAA has authorized the development of DPs and STARs based on satellite navigational aids. These are designed as Area Navigation (RNAV) DPs and

STARs. RNAV procedures are developed using earth-based coordinates (latitude and longitude). Using advanced navigation capabilities, RNAV provides the potential to improve NAS efficiency by providing point-to-point navigation capabilities. This can enhance enroute flexibility and terminal navigation.

When an RNAV procedure is associated with a "classic" procedure, the flight path does not change. To maintain consistency throughout the document, the "classic" route names are used to describe the proposed procedures and used in the exhibits.

Arrivals

The FUZZY 4 STAR would be modified and renamed the FUZZY 5 STAR with the TRAGR RNAV.

The existing FUZZY 4 STAR would be modified slightly to allow more efficient traffic management of all proposed procedures and named the FUZZY 5 STAR for classic procedures and TRAGR for RNAV procedures.

The proposed TRAGR RNAV supplements the FUZZY 5 STAR. **Exhibit 1-8, Exhibit 1-10, Exhibit 1-12, and Exhibit 1-14** depict the FUZZY 5 STAR which is overlayed by the TRAGR RNAV.

BEATY RNAV - The proposed BEATY RNAV arrival would provide a new route for RNAV equipped aircraft arriving from the northwest. This procedure is a stand-alone RNAV procedure. Aircraft utilizing the Classic procedure will be assigned the FUZZY 5 STAR. This BEATY STAR procedure is intended only for use by aircraft landing on Runway 19L and 19R. Exhibit 1-12 depicts the BEATY RNAV.

The location of the NOOTN STAR would be modified and renamed the LUXOR STAR with the KSINO RNAV.

The existing NOOTN STAR would be relocated farther north and named the LUXOR STAR. The OVETO DP, to be renamed the LAS VEGAS DP, would be relocated farther south, and the majority of aircraft would be given a left turn away from the most densely populated urban areas of the Las Vegas valley. This relocation would eliminate arrival traffic from crossing with departing traffic as they do in existing conditions. Aircraft on the new LAS VEGAS DP would be allowed unrestricted climbs and aircraft on the new LUXOR STAR would have idle power unrestricted descents. This would relieve controller coordination, avoid military airspace, and reduce aircraft overflights to the communities.

The KSINO RNAV supplements the LUXOR STAR. Exhibit 1-8, Exhibit 1-10, Exhibit 1-12, and Exhibit 1-14 depict the LUXOR STAR which is overlayed by the KSINO RNAV.

The location of the CRESO STAR would be modified and renamed the CLARR STAR and the SKEBR RNAV.

The existing CRESO STAR would be relocated farther west and named the SKEBR STAR. The OASYS DP would be replaced by the MCCARRAN DP, placing departing aircraft east of arriving aircraft. All south and west-bound aircraft on the proposed MCCARRAN DP would be given turns away from the most densely populated urban areas of the Las Vegas valley. These modifications would allow departing aircraft to climb unrestricted and arriving aircraft to descend unrestricted at idle power. These proposed procedures would relieve controller coordination, avoid the constricted airspace boundary between Las Vegas TRACON and Nellis Air Force Base, and reduce aircraft overflights of the communities north of LAS.

The SKEBR RNAV supplements the CLARR STAR. Exhibit 1-8, Exhibit 1-10, Exhibit 1-12, and Exhibit 1-14 depict the CLARR STAR, which is overlayed on the SKEBR RNAV.

The location of the PEACH SPRINGS STAR would be modified and renamed the MIROK STAR and the LYNSY RNAV.

The existing PEACH SPRINGS STAR would be relocated farther south and named the MIROK STAR. The MEAD DP would be replaced by the HOOVER DP for east-bound traffic and the MCCARRAN DP for south-bound traffic and the majority of aircraft would be given a turn away from the most densely populated urban areas of the Las Vegas valley. This would place the HOOVER DP north of the MIROK STAR providing unrestricted climb for departing aircraft and idle power descent for arriving aircraft. These modifications would relieve controller coordination, avoid the constricted airspace boundary between Las Vegas TRACON and Nellis Air Force Base, and reduce aircraft overflights of the communities north of the airport.

The LYNSY RNAV supplements the MIROK STAR. Exhibit 1-8, Exhibit 1-10, Exhibit 1-12, and Exhibit 1-14 depict the MIROK STAR overlayed on the LYSNY RNAV.

Departures

The location of the OVETO DP would be modified and renamed the LAS VEGAS DP and the AACES RNAV.

The existing OVETO DP, to be renamed the LAS VEGAS DP, would be relocated farther south, and the majority of aircraft would be given a left turn away from the most densely populated urban areas of the Las Vegas valley.

This relocation would eliminate arrival traffic from crossing with departing traffic as they do in existing conditions.

The AACES RNAV will supplement the LAS VEGAS DP. **Exhibit 1-9, Exhibit 1-11, Exhibit 1-13, and Exhibit 1-15** depict the LAS VEGAS DP overlayed on AACES RNAV.

The location of the MEAD DP would be modified and renamed the HOOVER DP and the MINEY RNAV and WYLDD RNAV.

The MEAD DP would be replaced by the HOOVER DP (East-bound traffic). South-bound traffic would be routed on the MCCARRAN DP. When departing Runways 25 and 19, the aircraft on the HOOVER and MCCARRAN DP's would be given a left turn away from the urban areas of the Las Vegas valley. This would place the HOOVER DP north of the proposed MIROK STAR providing unrestricted climb for departing aircraft and idle power.

The WYLDD RNAV will supplement the HOOVER DP. Exhibit 1-9, Exhibit 1-11, Exhibit 1-13, and Exhibit 1-15 depict the HOOVER DP which overlays the WYLDD RNAV.

The MINEY DP would be an RNAV procedure proposed to supplement the MCCARRAN DP for south-bound traffic. The MINEY DP would be used when landings and takeoffs are being conducted on Runways 7L and 7R. Exhibit 1-11 depicts the MINEY RNAV.

The location of the OASYS DP and the REDROCK DP would be combined, modified, and renamed the MCCARRAN DP with the STAAV RNAV, and the IDALE RNAV.

The OASYS DP would be replaced by the MCCARRAN DP, placing departing aircraft east of arriving aircraft. These modifications would allow departing aircraft to climb unrestricted and arriving aircraft to descend unrestricted at idle power. Exhibit 1-9, Exhibit 1-11, Exhibit 1-13, and, Exhibit 1-15 depict the MCCARRAN DP.

The STAAV RNAV procedure proposed to supplement the MCCARRAN DP would be used two percent of the time for aircraft proceeding to the north.

The IDALE RNAV would supplement the MCCARRAN DP for aircraft departing to the south and southwest.

Table 1-4 summarizes the elements of the Las Vegas Four Corner-Post Plan that constitute the Proposed Action of this EA.

Click here for Exhibit 1-8

Click here for Exhibit 1-9

Click here for Exhibit 1-10

Click here for Exhibit 1-11

Click here for Exhibit 1-12

Click here for Exhibit 1-13

Click here for Exhibit 1-14

Click here for Exhibit 1-15

Table 1-4
PROPOSED LAS PROCEDURES
McCarran International Airport

Existing Procedure (Classic)	Proposed Procedure (Classic)	Proposed RNAV Procedure	Proposed Direction	Proposed Responsible ARTCC Sector
Arrivals				
FUZZY 4 STAR	FUZZY 5 STAR	TRAGR	N, NW	16
NOOTN STAR	LUXOR STAR	KSINO	N, NE	7
*	*	BEATY	N, NW	16
CRESO STAR	CLARR STAR	SKEBR	S, SW	6
PEACH SPRINGS STAR	MIROK STAR	LYNSY	S, SE	8
CROWE STAR (INACTIVE)	N/A	N/A	N/A	N/A
VEEVA STAR (INACTIVE)	N/A	N/A	N/A	N/A
Departures				
OVETO DP	LAS VEGAS DP	AACES/STAAV	N, NE	7
MEAD DP	HOOVER DP (East-bound) MCCARRAN DP (South-bound)	WYLDD/MINEY	E, S	8
OASYS DP and REDROCK DP	MCCARRAN DP	IDALE/STAAV	N, SW	6,16
EBERT DP (INACTIVE)	N/A	N/A	N/A	N/A

Source: McCarran International Airport Instrument Approach and Departure Procedures; Loas Vegas TRACON.
* The BEATY RNAV would be a new RNAV procedure (runway 19 only, limited use)

1.9.2 Proposed Las Vegas TRACON Ceiling Increase

The Las Vegas Four Corner-Post Plan proposes increasing the Las Vegas TRACON ceiling from 15,000 feet MSL to 19,000 feet MSL. Departing aircraft would be allowed to climb unrestricted to 19,000 feet MSL before being transferred to Los Angeles ARTCC. This would decrease the amount of controller coordination required per departure, thereby increasing airspace efficiency.

1.10 PURPOSE AND NEED

The following section identifies the airspace problems associated with the Las Vegas TRACON (the *need* for the Proposed Action) and the proposed solution to the problem (the *purpose* of the Proposed Action).

1.10.1 Need for the Proposed Action

The following section identifies the airspace problems associated with the Los Angeles ARTCC, and the Las Vegas TRACON (the *need* for the Proposed Action) and the proposed solution to the problem (the *purpose* of the Proposed Action).

The City of Las Vegas is unique in that it is recognized as a world-class resort destination and the foremost gaming and entertainment center in the United States. It is also the site of many large conventions and trade shows that bring large numbers of business travelers to Las Vegas in concentrated time frames. This continued demand for hotel and convention services is the primary reason for the increase in demand at LAS.

McCarran International Airport is the 9th busiest airport in the United States and is served by 28 air carriers. Based on data contained in the *Northeast Extension of Concourse D*, prepared for Clark County, the following demand forecasts are provided:

> "Passenger activity at McCarran International Airport has increased from approximately 8.6 million enplanements in 1989 to approximately 16.9 million in 1999 – a total increase of 96 percent. This increase represents an average annual growth rate of about 7 percent. This large increase year after year can be attributed primarily to the rapid expansion of the Las Vegas economy, resident population growth, the development of major new resort complexes, and airlines providing service to Las Vegas at attractive fares. Also, a strong correlation has existed and continues to exist between the number of available hotel/motel rooms in the Las Vegas area and the number of passengers enplaned at LAS. Passenger enplanements are expected to increase to approximately 37.9 million by 2020, representing an average annual growth rate of 3.9 percent. The capacity of McCarran International Airport has been estimated at 27.5 million annual enplaned passengers.
>
> Aircraft operations at McCarran International Airport are projected to increase from 542,922 in 1999 to 705,000 by 2011. If airfield capacity did not constrain operations at LAS it is anticipated that annual aircraft operations would reach 724,160 by 2011 and 868,080 by 2020."

Less than optimum airspace design and procedures have created an impediment for air traffic controllers to efficiently manage the existing and forecast high traffic demand. The existing procedural conflicts were described in detail in Section 1.6 *Conflicts with Existing Procedures*.

Noise has become the greatest environmental consequence of having an airport in a community. Departure noise is generally far greater than arrival noise because aircraft engines are operating at full engine thrust. Existing departure procedures at LAS dictate that departing aircraft make right turns over the most densely populated urban

areas of the Las Vegas valley, and other populated areas. If demand at LAS grows as forecasted and the existing approach and departure procedures were not modified, those communities over-flown by aircraft today would likely experience an increase in aircraft overflights.

Although the Las Vegas Four Corner-Post Plan was not an original initiative of NAR, it has been recognized by the FAA as being the foremost strategy in the southwest and west regions of the country. Greater delays at large commercial airports across the country are increasingly costing the users and the flying public more time and money to participate in the benefits of air transportation. National Airspace Redesign is specifically tasked with designing an airspace environment that will enable air traffic to be managed efficiently, thereby benefiting the users and controllers of the national airspace system. The proposed modifications in the Las Vegas Four Corner-Post Plan would benefit the efforts set forth in NAR.

1.10.2 Purpose of the Proposed Action

The purpose of the Proposed Action is to address the air traffic/airspace inefficiencies and increased air traffic controller utilization to increase safety, efficiency, and ultimately reduce delay. The Las Vegas Four Corner-Post Plan (Proposed Action), developed by the Las Vegas TRACON and Los Angeles ARTCC includes a number of recommendations to improve the use of airspace, and air traffic control procedures, reduce interaction with Nellis Air Traffic Control Facility, and reduce aircraft overflights to communities in the Las Vegas valley.

Inefficiencies with the existing arrival and departure procedures created by the crossing of air traffic routes are addressed by the definition of new STAR and DP procedures, and increasing the TRACON ceiling from 15,000 feet MSL to Flight Level 190 (19,000 feet MSL). The proposed procedures would relieve airspace complexity so that both the Las Vegas TRACON and the Albuquerque Center could better manage existing and forecast demand. These procedures would establish arrival and departure paths that would eliminate the current conflicts between arrival and departure routes in the Albuquerque Center airspace. Arriving aircraft could establish unrestricted flight-idle descents over lightly populated areas and departing aircraft would have dedicated departure corridors that would allow unrestricted turbojet climbs.

Existing coordination with Nellis Air Traffic Control Facility would be reduced because the Runway 25 departures will make left turns away from the Nellis Air Traffic Control airspace. The proposed Runway 25 and Runway 19 departure corridors, which account for approximately 75 percent of all turbojet departures, are located over sparsely populated areas initially and transition to areas of no population.

Finally, the Proposed Action will allow aircraft to benefit from satellite navigation systems by implementing RNAV DPs and STARs. RNAV procedures do not rely upon such fixed facilities, but rely upon advanced on-board navigation computers capable of accurately identifying the aircraft's position and course along its route. RNAV equipment can compute aircraft position, actual track and ground speed, and

information relative to a flight route selected by a pilot. RNAV procedures would alleviate operational complexity and increase controller flexibility. When fully implemented, RNAV would simplify operations for pilots and controllers and provide more defined flight paths that are intended to decrease noise exposure to the communities.

1.11 TIMEFRAME

Estimated operational readiness is scheduled for October 4, 2001.

1.12 AGENCY AND PUBLIC COORDINATION

On January 26, 2001, the FAA's Western-Pacific Region issued a Notice of Proposed Action for the preparation of the Draft EA.

In April, the Draft Environmental Assessment was submitted to the public and interested agencies and parties. The release of the Draft EA initiated the start of a 30-day comment period. During the 30-day comment period, four comment letters were received. These comment letters were from:

- Department of Aviation, McCarran International Airport
- City of Las Vegas, Planning and Development Department, Comprehensive Planning Division
- City of Henderson
- Robert Hall and the Nevada Environmental Coalition Inc. (NEC)

Please refer to Appendix B for the responses to these comment letters.

Following the release of the Draft EA, a series of public workshops was held during the period of April 30 – May 3, 2001 to provide the public the opportunity to gather information and make oral and written comments on the Proposed Action. The public meetings were held on April 30, 2001 at Community College of Southern Nevada (Boulder City Campus) 6:00 – 8:00 p.m., May 1, 2001 at Community College of Southern Nevada (Henderson Campus) 6:00 – 8:00 p.m., May 2, 2001 at Grant Sawyer Middle School 6:00 – 8:00 p.m., and on May 3, 2001 at Renaldo Martinez Elementary School 6:00 – 8:00 p.m. The times and locations of these public workshops were advertised in the Las Vegas Sun and the Las Vegas Review Journal. Refer to Appendix C, *Coordination/Pubic Involvement,* for information related to the public workshops.

CHAPTER TWO

ALTERNATIVES

Federal Aviation Administration (FAA) Order 1050.1D, *Policies and Procedures for Considering Environmental Impacts,* cites the Council on Environmental Quality (CEQ) regulations (40 CFR 1502.1D) regarding the development and evaluation of alternatives in an Environmental Assessment (EA). In short, the EA should present the positive and negative aspects of the proposal, reasonable alternatives to the proposal, and the No Action Alternative in comparative form to provide the decision makers and the general public information on the merits of each alternative.

2.0 GENERAL

This chapter presents factors for airspace modifications; criteria for screening initial alternatives; evaluation of the initial alternatives; a summary of the initial alternatives; development of the alternative carried forward; alternatives eliminated from further consideration; and the recommended alternatives. This chapter also identifies potential alternatives for addressing the purpose and need as discussed in Chapter One, *Purpose and Need.* The alternatives were developed by the FAA to advance aviation safety and reduce air traffic delays. Equally considered were the constraints posed by the existing system to manage the arrivals and departures within the boundaries of the Los Angeles ARTCC and the Las Vegas TRACON airspace.

2.1 AIRSPACE MODIFICATION

There are many factors that may require airspace modifications. Some of these factors include, but are not limited to: safety, increasing traffic demand, operational restrictions (e.g. informal noise abatement procedures and Part 150 Programs), changing fleet mix, new technologies, airport expansions, new airports, military base closures, and facility consolidations.

Other than terrain and other obstructions such as tall buildings or radio towers in close proximity to airports there are no physical limitations to airspace modifications other than those imposed by the physics of flight and those set forth in the Federal Air Regulations (FARs). Airspace assigned to the Department of Defense (such as Special Use Airspace, Restricted Areas, and Military Operating Areas) also results in airspace limitations to airspace modifications. Options for airspace modifications generally fall into four categories:

1. Boundary Modifications

Boundary modifications involve changing the size and/or numbers of sectors within a facility's airspace, or changing the airspace delegated to the facility.

2. Flight Route Changes

Changes in the location, altitude, or the utilization of existing flight routes and/or new routes that may include arrivals, departures, or overflights.

3. Procedural Changes

These changes involve modifying the procedures utilized by air traffic controllers and pilots to operate within the air traffic control system.

4. Changes to Airspace Classification

Modifying the boundaries of an existing class of airspace or changing the classification. (Refer to Chapter One, *Section 1.4.2 Airspace*)

2.2 CRITERIA FOR SCREENING THE INITIAL ALTERNATIVES

Many of the factors that define the structure of air traffic routes are also the factors used to evaluate them. In many cases, the FAA must balance the factors and the resulting routes to find the best available compromise between each of the factors. The following criteria was used to evaluate alternative route structures for the Las Vegas TRACON airspace.

- **Safety** – Does the alternative maintain or improve the level of safety under varying conditions?
- **Traffic Management Efficiency** – Does the alternative provide an efficient method for improving the flow and management of air traffic? The route geometry should minimize intersecting routes and evenly distribute air traffic volume between routes to minimize the need to reroute traffic, thus improving the controller's ability to separate, sequence and meter traffic.
- **Air Traffic Controller Utilization** – Does the alternative provide sector boundaries that allow air traffic controllers to monitor and direct traffic with the least amount of controller/controller and controller/pilot communications? Controller/controller communication is required when an aircraft moves from one sector to another. Controller/pilot communication is required when the controller issues control instructions to amend an assigned altitude, course or speed.
- **Compatibility with Special Use Airspace (SUA)** – Does the alternative avoid SUA and reduce the interaction between civil and military aircraft?
- **Equipment Compatibility**– Does the alternative consider the compatibility of existing air navigation and air traffic control equipment and the availability of this equipment to FAA facilities and airspace users?
- **Compatibility with Other Procedures** – Does the proposed route structure fit within the regional route structure that will be unchanged?
- **Compatibility with Informal Noise Abatement Procedures –** Does the alternative comply with all informal noise abatement procedures?
- **Compatibility with Airspace Sector Design Criteria** – Does the alternative provide

a sufficient volume of airspace that allows air traffic controllers to separate, sequence and meter efficiently?

- **Community Compatibility** – Does the alternative reduce aircraft over-flight of the more urbanized areas below 10,000 feet AGL?

2.3 EVALUATION OF THE INITIAL ALTERNATIVES

The following section evaluates a range of seven initial alternatives for the Las Vegas TRACON. Four of the seven alternatives assessed potential airspace modifications while two additional alternatives assessed physical relocation of McCarran International Airport or combining of FAA and Department of Defense (DOD) air traffic control functions. The four airspace alternatives were developed by the FAA considering the need to separate arrival and departure routes, the surrounding terrain, the over-lying regional airspace and the location of SUA. The airspace alternatives were subject of several meetings with representatives of the Los Angles, Oakland, Albuquerque and Denver ARTCC's to determine impacts to airspace beyond the Las Vegas terminal.

Each initial alternative is qualitatively evaluated against each of the screening criteria outlined in Section 2.2 above. In accordance with CEQ, Section 1502.14 (d) [40 CFR 1502.14 (d)], the No Action Alternative must also be examined. Under the No Action Alternative, there would be no changes to the existing procedures or airspace structure. The evaluation is depicted in the form of a decision matrix, (Refer to **Table 2-1**) followed by a narrative further explaining the evaluation.

Table 2-1
INITIAL ALTERNATIVE EVALUATION MATRIX
McCarran International Airport

	Alternative	Safety	Traffic Management Efficiency	Air Traffic Utilization	Compatibility with SUA	Equipment Compatibility	Compatibility with Other Procedures	Noise Compatibility	Facility/Sector Compatibility	Community Compatibility
1	No Action	N	N	N	N	Y	Y	Y	Y	N
2	Proposed Action: Las Vegas Four Corner-Post Plan	Y	Y	Y	Y	Y	Y	Y	Y	Y
3	Modified MEAD DP	N	N	N	Y	Y	N	Y	N	Y
4	Modified OVETO DP	N	N	N	Y	Y	N	N	Y	N
5	Combine Nellis Airspace and Las Vegas Airspace	N	N	N	Y	N/A	N/A	N/A	N/A	N/A
6	Relocate LAS	N	N	N	N/A	N/A	N/A	N/A	N/A	N/A
7	Remove Some or All Operational	N	N	N	N	Y	N	N	N	N

Restrictions									

Y = Concern meets the specified criteria
N = Concern does not meet the specified criteria
NA = Not Applicable

Initial Alternative 1 (No Action Alternative)

In accordance with CEQ, Section 1502.14 (d) {CFR 1502.14(d)}, the No Action Alternative (Alternative 1) was also examined. The No Action Alternative would leave the existing East Corner-Post system in place. Departing aircraft would continue to receive altitude restrictions, and 75 percent of daily departures would continue to make right turn from Runways 19 and 25 over the most densely populated areas of the Las Vegas valley.

Safety – Maintaining the existing procedures may result in compromised safety due to increased demand on routes that cross other flight routes.

Traffic Management Efficiency – The existing procedures reduce traffic management efficiency as a result of route crossings. This problem is expected to increase as demand increases at LAS.

Air Traffic Controller Utilization – The combination of potentially reducing safety and decreasing traffic management efficiency result in increased air traffic controller utilization. This increased utilization is due to increased communications with aircraft and additional steps to maintain separation for safety.

Compatibility with Special Use Airspace (SUA) – The No Action Alternative would not provide any relief for current conflicts with existing Nellis Air Traffic Control Facility.

Equipment Compatibility – The No Action Alternative would not require additional air traffic equipment.

Compatibility with Other Procedures – While the existing procedures would not conflict with other regional air traffic procedures, it does not help to alleviate the conflicts within the airspace.

Compatibility with Informal Noise Abatement Procedures – The No Action Alternative would have no conflicts with any existing Informal Noise Abatement Procedures.

Compatibility with Airspace Sector Design Criteria – The No Action Alternative meets this criteria.

Community Compatibility - 75 percent of daily departures would continue to make right turns from runways 19 and 25 over the most densely populated areas of the Las Vegas valley, therefore, the alternative does not reduce aircraft overflights over

the most urbanized areas.

Initial Alternative 2 (Proposed Action)

The Proposed Action (Alternative 2) proposes modifications to existing arrival and departure procedures to improve operational efficiency and reduce airborne-induced delay.

Airborne-induced delay is created when departing aircraft use the same corridors as arriving aircraft. Altitude restrictions are placed upon both departures and arrivals where the routes intersect resulting in departures being held at a lower altitude and arrivals restricted from descending. Restrictions of this type prevent departing aircraft from reaching their most efficient operating altitude in a timely fashion and preclude arriving aircraft from employing a power off idle descent which adds to fuel burn for both departing and arriving flights. In the case of arriving aircraft this need to interrupt descent often results in longer vector patterns extending the aircraft's enroute time.

Alternative 2 would establish new arrival corridors separated from departure corridors thus allowing departing aircraft to climb unrestricted and arriving aircraft to descend unimpeded. For aircraft departing Runway 25 the initial turn to join the departure procedure would be to the left, thus reducing over-flight of the most densely populated urban areas of the Las Vegas valley.

The airspace boundary between the Las Vegas TRACON and Nellis Air Traffic Control Facility creates a narrow corridor north of the McCarran International Airport from the surface to 6, 000 MSL. The airspace at and above 7,000 feet MSL is delegated to the Las Vegas TRACON while altitudes below 6,000 feet MSL are delegated to Nellis Air Traffic Control Facility. This corridor is slightly less than five nautical miles wide and each control facility must remain one and one half miles from the boundary if operating at the same altitude to ensure aircraft under their control are separated from aircraft under control of the other facility. The combination of aircraft performance, high airport elevation and high temperatures can result in Runway 25 departures proceeding west of the airport to gain sufficient altitude to over fly the Nellis Air Traffic Control Facility airspace. The Las Vegas TRACON controller must devote significant concentration to this corridor to ensure compliance with separation standards. The proposed left turn from Runway 25 would relieve the Las Vegas TRACON controller of this responsibility.

Runway 19 departures would initially turn right and proceed southwest-bound to join the departure procedure and not over-fly the most densely populated urban areas of the Las Vegas valley as they do with the existing procedures. Runway 19 and 25 departures proceeding east on the HOOVER DP or the LAS VEGAS DP will pass south of Boulder City and at sufficient altitude not to impede aircraft on the MIROK STAR.

Safety – Alternative 2 would de-conflict routes which widens the margin of safety.

Traffic Management Efficiency – Improved efficiency results from reducing the number of crossings and minimizes conflict by designing crossings with altitude

separations.

Air Traffic Controller Utilization - Improved efficiency of airspace reduces the amount of communication and therefore reduces ATC utilization's.

Compatibility with Special Use Airspace (SUA) – Provides routes designed with the Nellis Air Traffic Control Facility airspace. The BEATY RNAV and the STAAV RNAV.

Equipment Compatibility - A new frequency for an arrival sector is the only equipment requirement for this Alternative.

Compatibility with Other Procedures – Fits within the Northwest 2000 Plan, (Phoenix Sky Harbor International Airport) and is congruent/compatible with NAR for the area.

Compatibility with Informal Noise Abatement Procedures – Alternative 2 does meet these requirements.

Compatibility with Airspace Sector Design Criteria – Makes best use of available airspace provides efficient flow into/out of airspace.

Community Compatibility – Reduces overflights of heaviest populated while increasing noise over least populated.

Initial Alternative 3 (Modified MEAD DP)

Initial Alternative 3 proposes to combine aircraft from the existing MEAD DP to the existing OASYS DP. The intent of this proposal is to eliminate the crossing of the existing NOOTN and PEACH SPRINGS STAR by the MEAD DP thus reducing or eliminating the need for altitude restrictions for both departures and arrivals.

This alternative would have the benefit of eliminating some of the right turns from Runway 25 thus reducing over-flight of the most densely populated urban areas of the Las Vegas valley. However, departures on the OVETO DP would still turn right off Runway 19 and Runway 25.

While this alternative solves the problem of the MEAD DP crossing the NOOTN and PEACH SPRING STARs it creates another crossing scenario with the existing CRESO STAR south of the McCarran International Airport. Aircraft that use the MEAD DP are destined for airports east and southeast of Las Vegas such as Dallas-Forth Worth, Albuquerque, Memphis and Phoenix. Ultimately, these aircraft would have to turn east toward their destination conflicting with the CRESO STAR.

Safety – De-conflicts some of the routes which increases the margin of safety.

However, a conflict will be created with the arrivals on the CRESO STAR.

Traffic Management Efficiency – De-conflicts/improves efficiency on the routes identified, however, a conflict with the CRESO STAR would reduce efficiency.

Air Traffic Controller Utilization – The conflicted routes remain.

Compatibility with Special Use Airspace (SUA) – The conflicts with Nellis Air Traffic Control Facility airspace would be eliminated with the modified MEAD DP, but would not be eliminated with the OVETO DP.

Equipment Compatibility - This alternative would not require additional air traffic equipment.

Compatibility with Other Procedures – This alternative does not fit with the Northwest 2000 Plan (Phoenix Sky Harbor International Airport).

Compatibility with Informal Noise Abatement Procedures – This alternative meets this criteria.

Compatibility with Airspace Sector Design Criteria – This alternative would improve efficiency by de-conflicting some of the routes, however, this alternative does not resolve all of the airspace conflicts.

Community Compatibility – The alternative would reduce some aircraft overflights over the most populated areas.

Initial Alternative 4 (Modified OVETO DP)

Initial Alternative 4 proposes to realign the existing OVETO DP by rotating it counter clock-wise and placing it in the airspace controlled by Nellis Air Traffic Control Facility. It would provide geographic separation of the OVETO DP from the NOOTN STAR thus solving the crossing problem on this route. It would allow departures on this route to climb unrestricted and not impede descent for aircraft using the NOOTN STAR.

This alternative would retain the right turn from Runways 19 and 25 and continue over-flight of the most densely populated urban areas of the Las Vegas valley.

Use of the relocated OVETO DP would be subject to approval of Nellis Air Traffic Control Facility on a not to interfere basis with military flight operation schedules. Approximately 30 percent of Las Vegas departures are assigned the OVETO DP. The requirement that Las Vegas TRACON coordinate and obtain approval for individual flights from Nellis Air Traffic Control Facility would substantially increase coordination between the two facilities. It would also require that another departure procedure be developed for use when approval could not be obtained. This alternate procedure would closely mirror the current OVETO

DP. The result of which would be the existing conflict with the NOOTN STAR.

The time required to accomplish the required coordination and the potential for having to reroute the aircraft if approval could not be obtained could potentially result in ground delays at the airport during peak departure demand periods.

Safety – This alternative requires increased coordination between the air traffic controllers, potential for misunderstanding of route assignments because of multi routes, and when the SUA airspace is not available, the existing conflicts remain.

Traffic Management Efficiency – Efficiency gains are limited to periods when access to SUA is permitted.

Air Traffic Controller Utilization – This alternative does not meet the criteria due to increase in air traffic controller coordination.

Compatibility with Special Use Airspace (SUA) - This alternative is compatible when the SUA access is permitted. However, access will be limited, therefore this is not a viable option for a primary departure route (approximately 30 percent of departures).

Equipment Compatibility - This Alternative would not require additional equipment therefore, it meets this criteria.

Compatibility with Other Procedures – Because the relocated OVETO DP would be subject to approval of Nellis Air Traffic Control airspace, on a not to interfere basis with military flight operation schedules, this Alternative does not meet the criteria.

Compatibility with Informal Noise Abatement Procedures – This alternative would require changes to the existing procedures between Las Vegas TRACON, Nellis Air Traffic Control Facility and the Los Angeles ARTCC. There would be conflicts with the existing noise abatement procedures.

Compatibility with Airspace Sector Design Criteria – This Alternative meets the criteria.

Community Compatibility – Alternative 4 would continue to route aircraft departures over highly populated areas of the Las Vegas valley.

Initial Alternative 5 (Combine Nellis Airspace with Las Vegas Airspace)

Initial Alternative 5 proposes merging the two air traffic control facilities located at Las Vegas (FAA) and Nellis Air Force Base (USAF). A single entity responsible for management of the airspace including commercial, military transient operations and

tactical training missions and general aviation would provide significant advantages. A common air traffic management philosophy providing equal balance to the National Airspace System (NAS) and the Department of Defense (DOD) would enable operating efficiencies to be developed absent parochialism by a single agency.

A single air traffic control facility could optimize airspace, providing priority to the military operational need when necessary while having the entire airspace available to accommodate LAS traffic much of the time. Controller utilization would be spread more evenly, routes could be better organized to reduce adverse impacts to surrounding communities and more dynamic real-time use of SUA to the benefit of all could be realized.

Adoption of this alternative would require extensive high level coordination between the DOD and the Department of Transportation. Alternative 5 would require a long term planning commitment (a minimum of five years after an agreement has been reached) and a significant financial investment on the part of both departments to address budget, staff, technical issues relating to realignment of resources, purchase of common equipment and development of a management philosophy that would meet the needs of the NAS and DOD.

This alternative is not a viable option because it does not meet the immediate purpose and need for this project. Also, it would still require flight route changes to de-conflict routes and maximize the efficient use of the airspace. Alternative 5 can not be implemented for many years and no design measures currently exist, therefore, there is insufficient information to fully assess this Alternative with the specified criteria.

Safety – Conceptually, this Alternative could increase the margin of safety if routes are fully de-conflicted. However, maintaining the existing procedures, in the interim, may result in compromised safety due to increased demand on conflicting routes.

Traffic Management Efficiency - Conceptually, this Alternative could increase traffic management efficiency. However, the existing procedures reduce traffic management efficiency as a result of route crossings. This problem is expected to increase as demand increases at LAS.

Air Traffic Controller Utilization - Conceptually, this Alternative could increase air traffic controller utilization. Until the Alternative could be implemented, the current procedures would result in increased air traffic controller utilization. This increased utilization is due to increased communications with aircraft and additional steps to maintain separation for safety.

Compatibility with Special Use Airspace (SUA) - Conceptually, this Alternative would increase compatibility with SUA.

Equipment Compatibility – This Alternative would require extensive equipment changes including a new facility.

Compatibility with Other Procedures – There is insufficient information available to assess this Alternative against the specified criteria.

Compatibility with Informal Noise Abatement Procedures - There is insufficient information available to assess this Alternative against the specified criteria.

Compatibility with Airspace Sector Design Criteria – There is insufficient information available to assess this Alternative against the specified criteria.

Community Compatibility - There is insufficient information available to assess this Alternative against the specified criteria.

Initial Alternative 6 (Relocate LAS)

Initial Alternative 6 proposes to find a more conducive site for commercial aircraft operations. The burgeoning demand for air travel has pushed many airports throughout the country to near capacity circumstances. Airlines have continually expanded schedules to meet the demand, while urban sprawl has continued to encroach upon airports making it ever more difficult for airports and communities to coexist.

The benefits of locating an environmentally compatible site are numerous; from reduction of community overflight, noise reduction, increased ground access, passenger accommodation and the ability to establish stringent land use restrictions around the airport. The process, however, is onerous and to date only one airport authority has successfully completed such relocation: Denver International Airport. Although the relocation of Denver International Airport was a success, it took 20 years of planning and construction and over three billion dollars worth of investment.

The Clark County Department of Aviation has begun preliminary planning for a new airport site. Should it become an airport, the Ivanpah Valley Airport may provide a long-term solution to realign airspace and air routes in the Las Vegas valley.

This Alternative is not a viable option because it does not meet the immediate purpose and need for this project. Alternative 6 can not be implemented for many years and no airspace design measures currently exist. Therefore, there is insufficient information to fully assess this Alternative with the specified criteria.

Safety – Conceptually, this Alternative could increase the margin of safety if routes are fully de-conflicted. However, maintaining the existing procedures, in the interim, would result in compromised safety due to increased demand on conflicting routes.

Traffic Management Efficiency - Conceptually, this Alternative could increase traffic management efficiency. However, the existing procedures reduce traffic management efficiency as a result of route crossings. This problem is expected to increase as demand increases at LAS.

Air Traffic Controller Utilization - Conceptually, this Alternative could increase air traffic controller utilization. Until the Alternative could be implemented, the current procedures would result in increased air traffic controller utilization. This increased utilization is due to increased communications with aircraft and additional steps to maintain separation for safety.

Compatibility with Special Use Airspace (SUA) - There is insufficient information available to assess this Alternative against the specified criteria.

Equipment Compatibility –There is insufficient information available to assess this Alternative against the specified criteria.

Compatibility with Other Procedures – There is insufficient information available to assess this Alternative against the specified criteria.

Compatibility with Informal Noise Abatement Procedures - There is insufficient information available to assess this Alternative against the specified criteria.

Compatibility with Airspace Sector Design Criteria – There is insufficient information available to assess this Alternative against the specified criteria.

Community Compatibility - There is insufficient information available to assess this Alternative against the specified criteria.

Initial Alternative 7 (Remove some or all Operational Restrictions)

Initial Alternative 7 proposes to remove some or all of the existing operational limitations in place at McCarran International Airport. These limitations impose restrictions on runway use and establish curfews which have the effect of prohibiting air traffic from fully using the infrastructure of the airport.

The operational limitations in effect are the result of negotiated agreements between Clark County Aviation Department and local communities. They are also contained in several environmental documents previously approved by the FAA, specifically the Environmental Impact Statement (EIS) which was the basis of the approval of recent runway extensions

This alternative is not reasonable, as it would violate the conditions of previous environmental approvals.

Safety – Maintaining the existing procedures may result in compromised safety due to increased demand on routes that cross other flight routes.

Traffic Management Efficiency – The existing procedures reduce traffic management efficiency as a result of route crossings. This problem is expected to increase as demand increases at LAS.

Air Traffic Controller Utilization – The combination of potentially reducing safety and decreasing traffic management efficiency result in increased air traffic controller utilization. This increased utilization is due to increased communications with aircraft and additional steps to maintain separation for safety.

Compatibility with Special Use Airspace (SUA) – The No Action Alternative would not provide any relief for current conflicts with existing Nellis Air Traffic Control Facility airspace.

Equipment Compatibility – The No Action Alternative would not require additional air traffic equipment.

Compatibility with Other Procedures – While the existing procedures would not conflict with other regional air traffic procedures, it does not help to alleviate the conflicts within the airspace.

Compatibility with Informal Noise Abatement Procedures – Due to the elimination of informal noise abatement procedures, this Alternative does not meet the criteria.

Compatibility with Airspace Sector Design Criteria – This Alternative would be the same as the No Action Alternative and meets the criteria.

Community Compatibility – Because this Alternative proposed to eliminate noise abatement procedures, this Alternative does not meet the criteria.

2.4 SUMMARY OF INITIAL ALTERNATIVES

Initial **Alternative 1,** the No Action Alternative, would ultimately reduce air traffic movement efficiency, air traffic controller productivity, and the airport's ability to handle demand. Eventually, the consumers, (who are the flying public), and the users of the NAS, (which include the airlines), would realize the effects of delay and the associated costs.

Initial **Alternative 2,** the Proposed Action, would modify arrival and departure procedures to improve operational efficiency and reduce airborne-induced delay. It would establish new arrival corridors separated from departure corridors allowing unrestricted climbs for departures. It would provide for unrestricted idle power descents for arriving aircraft. This alternative would modify the initial direction of turn from Runway 19 and 25 reducing flight over the most densely populated areas of the Las Vegas valley. It would reduce coordination between Las Vegas TRACON and Nellis Air Traffic Control Facility by avoiding the shared airspace north of the airport.

Initial **Alternative 3** proposes to combine aircraft from the MEAD DP to the OASYS DP. Similar to Alternative 2, it would eliminate the right turn for departures from Runway 25. It would have the advantage of reducing coordination by avoiding the shared airspace north of the airport, and would reduce overflight of the most densely populated areas of the Las Vegas valley. This alternative would create a crossing arrival/departure conflict south of the airport with the CRESO STAR. Since the aircraft that would be moved from the MEAD DP to the OASYS DP ultimately require a turn back to the east, crossing the CRESO STAR would result in altitude restrictions for both the arrival and departure flights.

Initial **Alternative 4** proposes to realign the existing OVETO DP and place it within the confines of the airspace delegated to Nellis Air Traffic Control Facility. This relocation would provide geographic separation of the OVETO DP from the NOOTN STAR allowing unrestricted climbs and descents. This alternative would retain the right turn for departures from Runways 19 and 25 and continue flight over the more densely populated urban areas of the Las Vegas valley. This alternative would increase required coordination between Nellis Air Traffic Control Facility and Las Vegas TRACON as each flight would require approval of Nellis Air Traffic Control Facility before it could depart. The potential for Nellis Air Traffic Control Facility to disapprove individual flights based upon military flight schedules has the potential to increase ground delays at the airport during peak departure demand.

Initial **Alternatives 5 and 6**, while worthy of discussion in this document, are not reasonable alternatives to meet the purpose and need for this project. Alternatives 5 and 6 are long range possibilities that require in-depth study and analysis by FAA, DOD, and Clark County.

Initial **Alternative 7** was also found to be unreasonable. It proposes the reduction or elimination of existing restrictions at McCarran International Airport. The restrictions are legally binding as they are encapsulated in previous environmental approvals or are the results of negotiated agreements with surrounding communities. Additionally, this Alternative would not address the issue of conflicting routes.

2.5 ALTERNATIVES CARRIED FORWARD

Initial Alternative 2 was the only alternative that met all the specified criteria. In addition to the No Action (Initial Alternative 1), the Proposed Action, (Initial Alternative 2) will be carried forward for detailed environmental evaluation.

2.6 DESCRIPTION OF THE PROPOSED ALTERNATIVES

The following describes the elements of the Proposed Action and the No Action Alternatives:

2.6.1 Alternative 1 – No Action

The No Action Alternative would make no changes to the existing air traffic procedures in the Las Vegas TRACON. Please refer to Chapter One, Section 1.5, *Existing Air Traffic Control Procedures* for a complete description of the No Action Alternative.

2.6.2 Alternative 2 – Proposed Action

The Proposed Action Alternative would modify existing arrival, (STAR) procedures and departures (DP) procedures for LAS, and increase the Las Vegas TRACON ceiling from

15,000 feet MSL to 19,000 MSL. Please refer to Chapter One, Section 1.9, *Description of the Proposed Action* for a detailed description of this Alternative.

2.7 ALTERNATIVES EXCLUDED FROM FURTHER CONSIDERATION

In addition to the initial alternatives described in Section 2.3, other alternatives, identified below, were excluded from further consideration.

2.7.1 Use of Other Modes of Transportation.

It has been determined that the use of other modes of transportation (e.g., rail, bus, automobile) would not eliminate the stated purpose of resolving airspace conflicts within the Las Vegas TRACON airspace. Other modes of transportation offer feasible alternatives to the air travel, particularly those traveling 250 miles or less. However, only 3 of the top 25 market cities served by McCarran International Airport fall within 250 highway miles of the City of Las Vegas. Beyond 250 miles, alternative modes of transportation become less desirable because of cost and time to reach the market. The use of other modes of transportation remains an inadequate alternative for meeting the purpose and need of this EA.

2.7.2 Use of Other Airports in the Region

The stated purpose for this EA is to address the air traffic/airspace inefficiencies and increased air traffic controller utilization to increase safety, efficiency, and ultimately reduce delays. No other existing airports in the immediate Las Vegas metropolitan area are capable of accommodating large commercial aircraft. Therefore, this is not a viable alternative for meeting the purpose and need of this project.

CHAPTER THREE
AFFECTED ENVIRONMENT

Pursuant to FAA Order 1050.1D, Chapter 6, Paragraph 65, *Affected Environment*, this chapter identifies or highlights any important background material that may help to explain the proposed project. This may include, but not limited to, characteristics of the local setting and surrounding areas, topography, social or socioeconomic profiles, and other such activities that the considered alternative may effect.

3.1 AIRPORT SETTING AND LOCATION

McCarran International Airport (LAS) is located in Clark County approximately five miles south of Las Vegas Nevada. Please refer to **Exhibit 3-1** for a Location Map. There are four public access roads into the airport, Paradise Road provides access to the airport from the north, and Russell Road from the west. Tropicana Blvd, can be used to enter the airport from the east and the I-215 connector and tunnel may be used to enter the airport from the south. The airport is 2,181 feet above mean sea level (MSL).

3.2 AIRPORT FACILITIES

McCarran International Airport is part of the Clark County Airport System, publicly owned by Clark County, Nevada and operated under the authority of the Board of County Commissioners.

McCarran International Airport is primarily a commercial airport allocating approximately 60 percent of its operations for commercial. There are two terminal facilities. Terminal One, the Main Terminal is used exclusively for commercial aviation, while Terminal 2 is used for charter aviation and international travel. The first level of Terminal One is designated for baggage claim, ticketing and ground transportation and the second level provides shopping, restaurants, and access to all gates via concourses A, B, C and D. In Terminal 2, there is the U.S. Customs Service, U.S. Immigration, and the U.S. Department of Agriculture. The west side of the Airport is used for general aviation and the east side of the airport is used for cargo operations.

3.2.1 Area Airports

In addition to LAS, there are five surrounding airports in the Las Vegas area. These surrounding airports include North Las Vegas Airport, Henderson Executive Airport, Jean Airport, Boulder City Airport, and Nellis Air Force Base.

Click here for Exhibit 3-1

North Las Vegas and Henderson Executive are smaller airports with general aviation facilities open to the public. **Exhibit 3-2** shows the location of these surrounding airports and their proximity to LAS. In addition to these three main facilities, there are numerous other non-towered airports throughout the Las Vegas TRACON boundary.

3.3 AIRSPACE AND AIR TRAFFIC CONTROL

The Federal Aviation Administration Act of 1958 established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The Western-Pacific FAA Region has administrative control of the Las Vegas project. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe and efficient airspace environment for civil, commercial, and military aviation. The NAS covers the common network of U.S. airspace, including air navigation facilities; airports and landing areas; aeronautical charts; associated rules, regulations and procedures; technical information; personnel and material. The system also includes components shared jointly with the military.

3.4 TOPOGRAPHY AND GEOGRAPHY

The City of Las Vegas is located in a broad desert valley in extreme southern Nevada. The mountains that surround the valley extend 2,000 to 10,000 feet above the valley floor. The Las Vegas valley comprises about 600 square miles and runs from northwest to southeast. The valley is bounded on the north by the Sheep Range, while Boulder City and the Lake Mead National Recreation Area are generally considered its southern extent. To the west are the Spring Mountains, which include Mt. Charleston, the region's highest peak at 11,918 feet. Several smaller ranges line the eastern rim of the valley, including the Sunrise Mountains, the Muddy Mountains, the Black Mountains, and the Trenchman Mountains. **Exhibit 3-3** depicts the topography around the Las Vegas area.

3.5 SOCIOECONOMIC PROFILES

Clark County is a political subdivision of the State of Nevada, established in 1909 and operated under the provisions of the general laws of the state. The Clark County seat of government is the City of Las Vegas. Clark County is comprised of 7,927 square miles and includes five incorporated cities: Las Vegas, Henderson, North Las Vegas, Boulder City, and Mesquite.

Click here for Exhibit 3-2

Click here for Exhibit 3-3

Clark County has grown in population and has developed the Las Vegas area into the biggest city in the state. **Table 3-1** shows the growth of Clark County and what percentage the County has represented through the past 100 years. This increase represents the popularity of the Las Vegas in comparison to the rest of the state of Nevada. This trend is expected to increase in the future.

Table 3-1
CLARK COUNTY, NEVADA
COUNTY PERCENTAGE OF STATE POPULATION

Year	Clark County	Nevada	% of the state
1900*	1,075	42,335	2.5%
1910	3,321	81,875	4.1%
1920	4,859	77,407	6.3%
1930	8,532	91,058	9.4%
1940	16,414	110,247	14.9%
1950	48,589	160,083	30.4%
1960	127,016	285,278	44.5%
1970	273,288	488,738	55.9%
1980	463,087	800,493	57.9%
1990	741,459	1,201,833	61.7%
2000	1,375,765	1,998,257	68.8%

* Clark County was not created until 1909. The 1900 census figure is the sum of Lincoln County precincts that are now part of Clark County.
Source: U.S. Census Bureau

3.6 NATURAL AREAS

Natural areas, as defined for the purpose of this EA, include parks, forests and recreational areas.

Humbolt Toiyabe National Forest, located to the west of the City of Las Vegas, covers over two million acres, and contains Nevada's two wilderness highlights, the Jarbridge Wilderness and the Santa Rosa Paradise Peak Wilderness. Located east of Las Vegas is Lake Mead National Recreation Area. Red Rock Canyon National Conservation Area and Desert National Wildlife Range Refuge are also located west of the Las Vegas calley. Clark County's two closest state parks are Floyd Lamb State Park, located approximately 15 miles northwest of the City of Las Vegas, and Spring Mountain Ranch State Park, located to the southwest of the City of Las Vegas.

In addition to national and state parks, there are several Wilderness Study Areas[1]. The national parks, state parks and Wilderness Study Areas are shown on **Exhibit 3-4**.

3.7 ENDANGERED AND THREATENED SPECIES

Coordination with the U.S. Fish and Wildlife Service (refer to Appendix D) provided a list of threatened and endangered species located in the state of Nevada. **Table 3-2** lists the Federally Endangered and Threatened Species in Nevada. Section 7 of the Endangered Species Act of 1973, as amended, requires Federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered species as a result in the destruction or adverse modification of the critical habitat of such species.

3.8 NATIVE AMERICANS

In 1998 President Clinton issued Executive Order (E.O) 13084, Consultation and Coordination with Indian Tribal Governments, covering tribal consultation. It recognized relationships between the Federal, State, and tribal Governments requiring Federal agencies to consult with tribal officials in their development of regulations that have tribal implications. The new E.O. 13175, Consultation and Coordination with Indian Tribal Governments, expands the provisions of 13084. In issuing E.O. 13175 on November 6, 2000, President Clinton said it "reaffirming our commitment to tribal sovereignty, self-determination, and self government" within the framework of federalism. The FAA must insure that local tribal governments are consulted and provided the opportunity to identify their concerns on proposed actions.

Federally recognized tribes posses certain inherent rights of self-government and entitlement to certain federal benefits, services, and protections because of the special trust relationship. The federally recognized tribes located around the Las Vegas areas are the Las Vegas Colony and the Moapa Band of the Paiute Native Americans.

The Las Vegas Colony - The Las Vegas Colony and Reservation in Clark County, is a federal reservation occupying approximately 16 acres within the city limits of Las Vegas. The Paiute Indians occupy this reservation. The Paiutes are descendants from the Nuwuvi people who lived in a large area of the Southwest east of the Colorado River. Of the 16 occupied acres in Las Vegas, approximately ten acres are residential and approximately six are used for business.

[1] Wilderness Study Areas (WSA), are the remaining relatively pristine, road-less areas of our public lands, designated by Congress, and will become part of our National Wilderness Reservation System. Until then, the Bureau Land Management will manage the areas to ensure that wilderness values are not lost.

Click here for Exhibit 3-4

Table 3-2
FEDERALLY ENDANGERED AND THREATENED SPECIES IN NEVADA

Common Name	Scientific Name	Endangered or Threatened
BIRDS		
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered
Peregrine Falcon	*Falco peregrinus*	Endangered
Wood Stork	*Mycteria americana*	Endangered
Brown Pelican	*Pelecanus occidentalis*	Endangered
Least Tern	*Sterna antillarum*	Endangered
FISHES		
cui-ui	*Chasmistes cujus*	Endangered
White River springfish	*Crenichthys baileyi baileyi*	Endangered
Hiko White River springfish	*Crenichthys baileyi grandis*	Endangered
Devils Hole pupfish	*Cyprinodon diabolis*	Endangered
Ash Meadows Amargosa pupfish	*Cyprinodon nevadensis mionectes*	Endangered
Warm Springs Amargosa pupfish	*Cyprinodon nevadensis pectoralis*	Endangered
Pahrump poolfish	*Empetrichthys latos latos*	Endangered
bonytail chub	*Gila elegans*	Endangered
Pahranagat roundtail chub	*Gila robusta jordani*	Endangered
Virgin River chub	*Gila seminuda*	Endangered
White River spinedace	*Lepidomeda albivallis*	Endangered
Moapa dace	*Moapa coriacea*	Endangered
woundfin	*Plagopterus argentissimus*	Endangered
Independence Valley speckled dace	*Rhinichthys osculus lethoporus*	*Endangered*
Nevada speckled dace	*Rhinichthys osculus nevadensis*	Endangered
Clover Valley speckled dace	*Rhinichthys osculus oligoporus*	Endangered
bull trout	*Salvelinus confluentus*	Endangered
razorback sucker	*Xyrauchen texanus*	Endangered
Warner sucker	*Catostomus warnerensis*	Threatened
PLANTS		
Steamboat buckwheat	*Eriogonum ovalifolium* var. *williamsiae*	Endangered
Amargosa niterwort	*Nitrophila mohavensis*	Endangered
Ash Meadows milkvetch	*Astragalus phoenix*	Threatened
Spring-loving centaury	*Centaurium namophilum*	Threatened
Ash Meadows sunray	*Enceliopsis nudicaulis* var. *corrugata*	Threatened
Ash Meadows gumplant	*Grindelia fraxinopratensis*	Threatened
Ash Meadows ivesia	*Ivesia kingii* var. *eremica*	Threatened
Ash Meadows blazingstar	*Mentzelia leucophylla*	Threatened
Ute lady's tresses	*Spiranthes diluvialis*	Threatened
INVERTEBRATES		
Ash Meadows naucorid	Ambrysus amargosus	Threatened
REPTILES		
Desert tortoise	*Gopherus agassizii*	Threatened

Source: Nevada Natural Heritage Program, Department of Conservation and Natural Resources

The Moapa Band of the Paiute - The Moapa Band of the Paiute Native Americans also reside in Clark County. The Moapa Reservation is located approximately 55 miles northeast of Las Vegas on Interstate 15. The town of Moapa, Nevada serves as the tribe headquarters. The 71,954-acre reservation, composed of alternating desert and range lies approximately 24 miles east of the Nevada Test Site and approximately 12 miles north of Lake Mead National Recreational Area.

Exhibit 3-5 depicts the Las Vegas Colony Native Americans and the Paiute Native American reservations around the Las Vegas area.

Click here for Exhibit 3-5

CHAPTER FOUR
ENVIRONMENTAL CONSEQUENCES

Pursuant to Federal Aviation Administration (FAA) Order 1050.1D, Chapter 6, Paragraph 66, *Environmental Consequences*, this Chapter describes the environmental impacts of the Proposed Action and the No Action Alternatives, any adverse environmental effects which cannot be avoided should the proposal be implemented, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented. This chapter also describes the mitigation measures designed to mitigate adverse environmental impacts to a less-than-significant level, if required. Those environmental impact categories required by FAA Order 1050, 1D includes:

- Noise
- Compatible Land Use
- Social Impacts
- Induced Socioeconomic Impacts
- Air Quality
- Water Quality
- Department of Transportation 4(f)
- Historic, Architectural, Archeological and Cultural Impacts
- Biotic Communities
- Endangered and Threatened Species
- Wetlands
- Floodplains
- Coastal Zone Management
- Coastal Barriers
- Wild and Scenic Rivers
- Farmland
- Energy Supply and Natural Resources
- Light Emissions
- Visual Impacts
- Solid Waste
- Construction
- Environmental Justice

4.1 EVALUATION OF ENVIRONMENTAL CONSEQUENCES

Since the majority of the Four Corner-Post Plan involves aircraft route changes at altitudes above 3,000 feet, and does not involve any physical construction activities, many of the resource categories listed above would not be affected. For example, the proposed procedures would not impact environmental factors relating to the physical environment (water quality, biotic communities, endangered and threatened species of fauna and flora, wetlands, floodplains, coastal zone management, coastal barriers, wild and scenic rivers, or farmlands). Likewise, the proposed procedures do not have any physical construction issues, so construction impacts (for example, energy supply and natural resources, light emissions, solid waste, or construction) are not necessary to evaluate.

4.1.1 Additional Environmental Consequences Not Evaluated

As stated above in Section 4.1, due to the altitude of the air traffic route changes, and because there will be no land based construction activities, the following additional environmental consequences are briefly discussed why they will not be evaluated.

4.1.1.1 Air Quality

The implementation of the Proposed Action would not increase flights. The anticipated increase in the annual number of aircraft operations at LAS would occur regardless of the implementation of the Proposed Action. Therefore, the existing pollutant levels, or air emissions due to operations of aircraft, will not increase as a result of the Proposed Action.

The project does call for shifting various flight tracks and/or procedures but is not expected to increase air emissions associated with these changes. Because these changes will occur well above the mixing zone, (approximately 3,000 feet) no change in ground level pollutant concentration is anticipated.

Federal Regulations at 40 CFR 51.853(b) requires a conformity determination for federal actions that would result in the emission of air pollutants that exceed specified levels. However, a conformity determination is not required for federal actions resulting in *de minimis* air emissions as published in 58 FR 63253, November 30, 1993. Additionally, the criteria of the General Conformity Rule (40 CFR, Part 510) contains exemptions to conformity. The rule identifies a list of actions that would result in no emissions increase or an increase in emission that is clearly *de minimis*. Examples include air traffic control activities and adopting approach, departure and en-route procedures. Under FAA Order 1050.1D, an air quality analysis is not required for the Proposed Action as no change to established air traffic capacity or frequency of aircraft operations would result from implementation of the Proposed Action.

4.1.1.2 Compatible Land Use

FAA Order 1050.1D, Attachment 2, Paragraph 3 states that "the compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of noise impacts related to that airport." For the purpose of this analysis, potential noise impact areas were applied to city and county land use maps for a determination of compatibility.

The purpose of considering noise in the land use planning process is not to prevent development but rather to encourage development that is compatible with carious noise levels. The objective is to guide noise sensitive land uses away from the noise and encourage non-sensitive land uses where there is noise.

The FAA adopted land use compatibility guidelines when it promulgated Federal Aviation Regulations (FAR) Part 150, *Airport Noise Compatibility Planning*. The FAR Part 150 land use compatibility guidelines are most often used in airport noise studies. They are also often used as the basis for determinations of land use compatibility made in Federal environmental assessments and impact statements. For purposes of this Environmental Assessment, noise is considered important when it affects “noise sensitive” land uses.

The noise analysis described in this Chapter, Section 4.2, concluded that the Proposed Action does not exceed the thresholds for a “significant” impact on noise-sensitive land use. Thus, the Proposed Action is considered to have no adverse impact on noise-sensitive land uses and no analysis will be conducted for land use compatibility issues.

4.1.1.3 Social Impact

Social impacts associated with air traffic procedural changes are not generally related to the relocation of homeowners, businesses, or other community disruption that may be caused by related construction or land acquisition activities. The Proposed Action would not disrupt or involve property acquisition, construction, disrupt the pattern of local land uses, or alter surface transportation patterns. Additionally, noise impacts are negligible; therefore, there is no need for an analysis of this impact category.

4.1.1.4 Induced Socioeconomic Impacts

Implementation of the Proposed Action would not result in shifts in patterns of population movement and growth, public service demands, or change in business and economic activity. Therefore, this impact category will not be studied.

4.1.1.5 Environmental Justice

In response to Executive Order 12898, the Proposed Action does not acquire land, displace people, or impact noise upon low-income or minority populations. Minority population areas are defined as areas exceeding 50 percent of the general population.

Low-income is determined based upon median household income being at or below poverty level. According to the 2000 Census data, neither of these conditions are representative of the areas affected by the Proposed Action.

4.1.2 Potential Impact Categories

The aircraft route changes, identified by the Proposed Action, only have the potential to impact the following resource categories:

- **Noise** – The change in aircraft routes has the potential to expose certain areas that have not experienced noise in the past.
- **Department of Transportation 4(f)** – The potential noise and visual impacts may disrupt parks, recreation areas, wildlife and waterfowl areas, and historic structures.
- **Historic, Architectural, Archeological and Cultural** – The potential noise and visual impacts to Section 106 lands.
- **Visual** – The potential for visual impacts to adversely effect Section 106 lands.

The remainder of this Chapter discuses the methodologies and results of the analysis used to evaluate the Proposed Action and the No Action Alternative.

4.2 NOISE

Aircraft noise is often the most noticeable environmental effect associated with an aviation project. It is undoubtedly the most controversial and its applied methodologies are the hardest to understand. This section will evaluate the environmental impact of cumulative noise energy exposure on individuals as a result of aviation operations for the Proposed Action and the No Action Alternative. This noise energy exposure is expressed in terms of yearly day/night average sound level (DNL). The FAA has determined that a significant noise impact would occur if a detailed noise analysis indicates that the proposed project results in an increase within DNL 65 dB contour of 1.5 dB or greater on any noise sensitive area. If this were to occur, the FAA must provide mitigation measures to reduce this to a less than significant level, or if unattainable, suspend the Environmental Assessment (EA) analysis and conduct an Environmental Impact Statement (EIS).

4.2.1 Noise Analysis Methodology

Aircraft noise level evaluations for this EA were developed using the Integrated Noise Model, Version 6.0B. The model was used to compute noise at locations surrounding LAS resulting from various STAR or DP procedures that are proposed by the Four-Corner Post Plan that is a part of the National Airspace Redesign.

The Day-Night Sound Level (DNL)[1] methodology was developed by the Environmental Protection Agency to describe the cumulative impact of noise exposure on residential areas. It combines the loudness and length of time each aircraft noise event is heard with the number of events and time of day that the operations occur. Those operations that occur between the hours of 10:00 p.m. and 6:59 a.m. are assessed a ten decibel penalty that equates to each event being considered to have ten times as much noise energy as it would have during the daytime hours. Consequently, an area exposed to large numbers of events at night would have a disproportionately larger noise contour than an area without many night events, even though the total number of operations might be equal. The penalty is assessed in recognition of the greater sensitivity of residential uses to noise that occurs at night and to the generally quieter ambient noise levels that occur during those hours.

Because the Proposed Action deals with airspace routing changes above 3,000 feet above the ground, the noise evaluations consider the potential noise level effect of approaching aircraft to an altitude of 10,000 feet above ground level (AGL) and departing aircraft to an altitude of 13,000 feet AGL. This methodology exceeded the FAA's criteria for noise analysis.[2] The controlling characteristic in noise level evaluation for high-altitude assessments is the cumulative noise level to which an area is or may become exposed by changes to airspace utilization. Federal Aviation Administration guidelines provide that any noise sensitive area exposed to a noise level increase of 1.5 decibels of DNL or more that falls within the 65 DNL contour of the proposed action condition is considered to be "significantly" impacted by the change. Furthermore, if that condition occurs, any area within the 60 to 65 DNL contour band of the Proposed Action and exposed to an increase of 3 decibels of DNL or more by the change must be reported. Finally, any area exposed to an increase of 5 decibels or more of DNL and is exposed to a cumulative level of 45 to 60 DNL or more by the Proposed Action must also be reported.

This section will indicate the areas exposed to each of the three categories of noise level increase that are, under federal guidance, to be reported. Because the Proposed Action deals solely with instrument flight operations (IFR), the noise levels associated with aircraft using local flight patterns (VFR) are not addressed for this analysis. Noise level changes between the proposed air traffic procedures and the current procedures will be reflected by the differences between "before" and "after" noise levels plotted on the various exhibits in this section. Noise levels for year 2000 (current traffic level) and 2005 (future traffic level) conditions are projected.

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1 The DNL metric utilizes A-Weighted, which depresses noise levels in low and high frequency bands, approximately the frequency response of the human ear.

2 Until January, 2001, the potential effects for departing aircraft were required to be assessed to an altitude of 18,000 if the cumulative noise levels associated with those actions exceeded 45 decibels of DNL. As a result of the Chicago Terminal Area Plan (CTAP), the FAA determined that changes between 10,000 and 18,000 feet would not result in cumulative noise levels above 45 decibels of DNL in a normal environment. Therefore, departing aircraft would be assessed to an altitude of 10,000 ft.

In addition to the DNL analysis contained in this Section, other supplemental noise monitoring and ambient noise background information is contained in Appendix A, *Noise.* This additional information is provided to the reader to assist in understanding general noise conditions as it relates to existing ambient noise levels and the potential for change to the ambient levels caused by the Proposed Action.

4.2.1.2 INM Program Input

A variety of user-supplied information is required to accurately run the Integrated Noise Model (INM) to compute aircraft noise levels in the airport environs and along the routes of flight leading to and from the airport. In the case of the Las Vegas Four-Corner Post Plan, noise levels were computed for operations associated with only McCarran International Airport. It does not address operations at other satellite airports that handle much of the light general aviation traffic in the region. McCarran International Airport handled in excess of 550,000 operations in 2000, including a mixture of domestic and international passenger traffic, cargo operations, and substantial general aviation activity.[3]

The INM requires that airport runways and flight tracks be defined through a system of geographic coordinates, and that the volume of traffic using the airport be distributed among them. This distribution is divided among numerous aircraft types and the time of day at which they operate.

For this analysis, input data was developed from three sources.

1. FAA's Terminal Area Forecasts for the annual level of operations in 2001
2. Forecast information supplied by Clark County Aviation Department for year 2005 operations.
3. A recently completed assessment of noise levels for the year 1999 at McCarran International Airport provided runway utilization, fleet mix and time of day distribution guidance for that facility.[4] This document also provided definitions of flight tracks used for noise modeling by this assessment to serve as the baseline on the No Action Alternative. This document also incorporates the adopted noise abatement flight procedures in effect at the airport.

[3] Federal Aviation Administration, Terminal Area Forecasts, 2001.

[4] Brown-Buntin Associates, Inc. provided INM input files prepared for a 1999 noise contour update of its April 1998 report, Noise Contour Update – 1997/98, McCarran International Airport, prepared for the Clarke County Department of Aviation, April 16, 1998.

4.2.1.3 Activity Data

For this analysis, the number of daily operations for the year 2000 and forecast year 2005 were derived from the FAA's 2001 Terminal Area Forecasts and Clark County Department of Airports forecasts. The data include total average daily operations, distributed among general categories of user. Information on fleet mix and day/night distributions and runway usage was based on the 1999 Brown-Buntin information.

The average number of daily operations was derived by dividing the annual operations, as reported by the 2001 TAF or the County forecasts, by 365. **Table 4-1** provides a summary of the annual and annual average daily operations used in this assessment to project noise levels for each facility in the years 2000 and 2005.

The computations indicate that McCarran International Airport experienced an estimated average of 1,523 operations each day during 2000. In the year 2005, the total number of operations is forecast to grow by approximately 12 percent to exceed 622,000 operations or 1,704 on an annual average day.

Table 4-1
FORECAST ANNUAL OPERATIONS
McCarran International Airport

Facility	Annual Operations		Operations Per Annual Average Day	
	2000	2005	2000	2005
McCarran International Airport	556,000	622,000	1,523	1,704

Source: Terminal Area Forecasts, 2001

4.2.1.4 Fleet Mix

The distribution of the operations among the many types of aircraft available within the INM is a critical component of the INM input data. The distribution among types for 2000 was based on the 1999 Brown-Buntin Report. For 2005, the current fleet mix was allocated among several groups of aircraft reported in the Clark County aviation forecasts and distributed across the total number of operations forecast to that year.[5] Any aircraft included in the 1999 study that weighed more than 75,000 pounds, and that did not meet the requirements of Part 36 for Stage 3 aircraft, were converted to retrofit versions of the same aircraft that did meet Stage 3 noise levels. The average daily operations by aircraft type for LAS is presented in **Table 4-2**.

[5] Additional consultation with Brown-Buntin Associates and McCarran International Airport resulted in the modification of the fleet mix to account for differences in general aviation jet operations and the retiring of B-727 aircraft.

Table 4-2
AVERAGE DAILY OPERATIONS BY AIRCRAFT TYPE (FLEET MIX)
McCarran International Airport

	2000 Takeoffs			Landings				2005 Takeoffs			Landings		
INM Type	Day	Night	Total	Day	Night	Total		Day	Night	Total	Day	Night	Total
Jets													
727EM2	20.1	4.2	24.3	16.2	8.0	24.3		3.7	0.8	4.5	3	1.5	4.5
737400	196.1	33.2	229.2	191.0	38.2	229.2		287.4	48.6	336.0	280.0	56.0	336.0
737N17	5.0	0.0	5.0	3.0	2.0	5.0		7.4	0.0	7.4	4.4	2.9	7.4
74720B	4.0	0.0	4.0	4.0	0.0	4.0		8.7	0.0	8.7	8.7	0.0	8.7
757PW	52.3	23.4	75.7	48.6	27.1	75.7		68.9	30.9	99.8	63.9	35.9	99.8
767300	7.0	3.0	10.1	5.0	5.0	10.1		15.2	6.5	21.7	10.9	10.9	21.7
A310	1.0	0.6	1.6	1.6	0.0	1.6		2.2	1.2	3.4	3.4	0.0	3.4
A320	27.1	17.1	44.2	18.1	26.1	44.2		39.8	25.1	64.8	26.5	38.3	64.9
CL601	0.0	1.0	1.0	0.0	1.0	1.0		0.0	0.5	0.5	0.0	0.5	0.5
DC1010	5.0	0.0	5.0	4.0	1.0	5.0		10.9	0.0	10.9	8.7	2.2	10.9
DC93LW	0.0	1.0	1.0	1.0	0.0	1.0		0.0	1.5	1.5	1.5	0.0	1.5
F16A	1.0	0.0	1.0	1.0	0.0	1.0		0.5	0.0	0.5	0.5	0.0	0.5
L1011	2.0	0.0	2.0	2.0	0.0	2.0		4.3	0.0	4.3	4.3	0.0	4.3
LEAR35	64.6	11.4	76	66.1	9.9	76		55.3	9.7	65	56.6	8.4	65
MD11GE	1.0	1.0	2.0	2.0	0.0	2.0		2.2	2.2	4.3	4.3	0.0	4.3
MD83	36.2	2.0	38.2	32.2	6.0	38.2		53.1	2.9	56.0	47.2	8.8	56.0
MD9025	5.0	0.0	5.0	5.0	0.0	5.0		7.4	0.0	7.4	7.4	0.0	7.4
Subtotal	497.3	110.2	607.5	472.7	134.8	607.5		588.7	128.8	717.5	550.4	167.1	717.5
Props													
BEC58P	37.5	2.0	39.5	37.5	2.0	39.5		37.9	2.0	39.9	37.9	2.0	39.9
CNA441	51.1	2.6	53.7	51.1	2.6	53.7		51.5	2.7	54.2	51.5	2.7	54.2
COMSEP	12.5	4.0	16.5	15.8	0.7	16.5		12.6	4.0	16.6	16.0	0.7	16.6
DHC6	23.9	7.0	30.9	30.9	0.0	30.9		12.9	3.8	16.8	16.8	0.0	16.8
DHC8	0.0	2.0	2.0	0.0	2.0	2.0		0.0	1.1	1.1	0.0	1.1	1.1
HS748A	2.0	1.4	3.4	3.4	0.0	3.4		1.1	0.8	1.9	1.9	0.0	1.9
SF340	8.0	0.0	8.0	8.0	0.0	8.0		4.4	0.0	4.4	4.4	0.0	4.4
Subtotal	135.1	19.1	154.1	146.9	7.3	154.1		120.5	14.3	134.8	128.4	6.4	134.8
Grand Total	632.4	129.2	761.6	619.6	142.1	761.6		709.2	143.1	852.3	678.8	173.5	852.3

Sources: Las Vegas McCarran International Airport, Brown,-Buntin Noise Report, 1999; Terminal Area Forecasts, 2001; Clark County aviation forecasts

4.2.1.5 Time-of-Day

The time of day that operations occur is important to the computation of the cumulative average noise level because a penalty of ten decibels is assigned to each operation that occurs between the hours of 10 p.m. and 6:59 a.m. The distribution between day and night flights presented in the 1999 Brown-Buntin data is assumed to be representative of that facility's flight time distribution for the forecast years. On an average day, approximately 18 percent of aviation traffic operating at LAS take place during the night hours (10 p.m. to 6:59 a.m.).

4.2.1.6 Flight Paths

The routes along which aircraft fly to approach or depart the airport are the fourth critical component in the definition of aircraft noise patterns in the community. For this evaluation, flight paths for the No Action and Proposed Action Alternatives were developed from a combination of standard approach and departure procedure definitions as published by the TRACON for the airport, and dispersed through

comparison plots of radar data depicting the locations of aircraft as they flew to and from the airport. The distribution of traffic among the flight tracks used in the 1999 Brown-Buntin data was used in the assignment of operations to the flight patterns defined for No Action conditions. For the Proposed Action Alternative, flight tracks were similarly developed through the definition of routes of proposed STAR and DP procedures and were dispersed to reflect corridor widths comparable to those associated with current procedures.

The procedures evaluated by this EA are both Classic and RNAV procedures. The RNAV procedures are expected to be used by approximately 75 percent of the active jet fleet, while the classic procedures are expected to be used by about 25 percent of the fleet. The RNAV procedures are expected to fly along paths approximately one-mile in width, while the classic procedures would follow courses that are between approximately one to eight miles in width, dependent upon the distance from the airport. This dispersion reflects the anticipated vectoring assigned to aircraft as they move through the airspace between enroute fixes. **Exhibit 4-1** depicts the existing and proposed arrival flight tracks used for the INM modeling of the No Action and Proposed Action conditions. Similarly, **Exhibit 4-2** depicts the departure flight tracks used for the INM modeling of the No Action and Proposed Action conditions.

4.2.1.7 Flight Profiles

An optional element of the INM provides the ability to define descent profiles representative of the proposed procedures. For high altitude noise assessments, approach procedures are evaluated to an altitude of 10,000 feet above the airport field elevation (AFE) and departures are evaluated to an altitude of 13,000 feet AFE. For the purposes of INM modeling, AFE is used to assess the relationship between aircraft altitude and the airport field elevation. The INM also takes into account terrain data to calculate the altitude of the aircraft above the ground. For the purpose of presenting altitudes in this EA, the Proposed Action and No Action Alternatives reflect Mean Sea Level (MSL) elevations for all exhibits and tables.

In each case, the evaluation is tempered by the requirement that the cumulative annual average noise level under these flight paths must exceed 45 decibels of DNL and that the increase from baseline conditions must exceed 5 dB if between 45 and 60 DNL; 3 dB if between 60 and 65 DNL; and 1.5 dB if the noise level of the proposed condition is greater than 65 DNL. The default approach profile associated with the INM calls for a three degree descent from 6,000 feet AFE. Beyond that point, the model assumes a continuation of the descent below 6,000 feet AFE. Within the vicinity of LAS, there are no current or proposed approach routes within the 45 DNL contour that are not adequately represented by the default profiles in the model.

Click here for Exhibit 4-1

Click here for Exhibit 4-2

Similarly, revisions to departure procedures are to be evaluated to an altitude of 10,000 feet AFE, tempered by the provision that they are notable if they result in an increase in DNL as described in the previous paragraph. The default profiles for the various aircraft expected to use LAS result in attainment of 10,000 feet AFE at distances from the airport ranging from 13 to 30 miles along the route of flight. The aircraft that are associated with the slowest climbs are those that are the largest and heaviest (B-747, DC-10, L-1011) bound for destinations more than 1,500 miles from the airport. Small aircraft bound to the same locations typically reach 10,000 feet AFE between 15 and 25 miles along the route of flight. Consequently, the aircraft departing LAS will, on an average day, normally be above 10,000 feet AFE before they reach the first transition fix leading out of the TRACON boundary. For heavier aircraft, the IDALE and STAAV RNAV departures may be an exception to this typical condition.

4.2.1.8 Route Utilization

The frequency at which a flight route is used is the sixth critical component necessary to predict the noise pattern in the region. An assessment of regional radar data for the one-week period in early December 2000 indicates a general traffic distribution pattern among departure and approach routes leading from/to the area airports. See Appendix A, for existing and proposed route utilization information.

4.2.1.9 Runway Usage

The seventh and final factor used to program the INM was the assumed utilization of the runways. The 1999 Brown-Buntin data indicates a distribution of operations among jet and propeller aircraft for the 1999 time period. The information provided by that document was assumed to be representative of the annualized condition for both the No Action and Proposed Action conditions in the existing and future time frames. Use of individual runways, as drawn from the 1999 Brown-Buntin data is presented in **Table 4-3**. Runway usage would not be changed due to the Proposed Action. Therefore, the runway use percentages shown on Table 4-3 are representative of both the Proposed Action and the No Action. The specific use of individual runways at the various satellite facilities is not critical to the assessment of the impacts of the proposed changes to the STARS and DPs in use in the area.

Table 4-3
RUNWAY USAGE
McCarran International Airport

Aircraft Group		Departures		Arrivals	
	Runway	Day	Night	Day	Night
Aircraft > 75,000 lbs					
	19L	17.58%	0.00%	1.29%	0.00%
	19R	1.32%	0.00%	19.22%	0.00%
	1L	0.88%	0.00%	13.19%	0.00%
	1R	9.67%	0.00%	1.47%	0.00%
	25L	1.59%	2.28%	46.72%	72.46%
	25R	67.26%	96.02%	17.11%	26.54%
	7L	1.70%	1.70%	0.10%	0.10%
	7R	0.00%	0.00%	0.90%	0.90%
	Total	100.00%	100.00%	100.00%	100.00%
Aircraft < 75,000 lbs					
	19L	23.40%	23.40%	16.20%	16.20%
	19R	50.50%	50.50%	57.80%	57.80%
	1L	14.20%	14.20%	17.10%	17.10%
	1R	6.60%	6.60%	4.80%	4.80%
	25L	0.70%	0.70%	1.50%	1.50%
	25R	2.30%	2.30%	1.60%	1.60%
	7L	2.20%	2.20%	0.10%	0.10%
	7R	0.10%	0.10%	0.90%	0.90%
	Total	100.00%	100.00%	100.00%	100.00%

Day = 7:00 a.m. to 9:59 p.m.
Night = 10:00 p.m. to 6:59 a.m.

4.2.2 Assessing the Impact of Noise

Noise exposure contours and areas of increased noise exposure were prepared in order to determine if potential noise impacts would occur as a result of the Proposed Action.

The criteria for assessing increased noise exposure is described below:

- 1.5 dB or more increase within the area exposed to an average annual dB of 65 decibels or more by the proposed project (an environmentally significant increase)[6]. NEPA guidance states that an increase of 1.5 dB within an area of 65 DNL is considered a significant impact and therefore this analysis is required to determine if significant noise impacts result from the Proposed Action.

[6] For environmental evaluations, these areas of reportable difference were developed by applying the Noise Level Difference computation option of the INM. This option subtracts the noise levels computed for the No Action condition from the Proposed Action condition to indicate the change associated with the proposed modification to the baseline condition. This analysis is based on FAA Notice FAA-AEE-99-01.

- 3.0 dB or more increase within the area exposed to an average annual dB of between 60 and 65 decibels by the proposed project (a reportable increase)[5]. This marginal impact area is based on guidance provided by the Federal Interagency Committee on Noise (FICON), which is used to identify noise impacts outside 65 DNL.
- 5.0 dB or more increase within the area exposed to an average annual dB of between 45 and 60 decibels by the proposed project (a reportable increase).[5]

FAA Order 1050.1D, Policies and Procedures for Considering Environmental Impacts, provides FAA air traffic control personnel guidance when considering actions for new or revised procedures that would route air traffic over noise-sensitive areas above 3,000 feet above ground level (AGL). Actions above 3,000 feet AGL may be considered "Categorically Excluded", however such changes may generate adverse community reaction. Recognizing this potential, the FAA issued FAA Notice FAA-AEE-99-01, Noise Screening Procedure for Certain Air Traffic Actions Above 3,000 Feet AGL. By employing this screening process air traffic personnel can determine if the proposed air traffic change will result in a 5dB or more increase in the overall DNL of any residential area. This screening process is applicable to large civilian turbojet operations weighing more than 75,000 pounds. It does not include small general aviation aircraft, turboprops or helicopters.

Exhibit 4-3 displays the noise exposure contours for the 2000 No Action and 2000 Proposed Action conditions. Areas of increased noise exposure are highlighted on the exhibit as well. **Exhibit 4-4** provides a detailed view of the 1.5 dB increase within the 65 DNL area. Similarly, **Exhibits 4-5** and **4-6** display the noise exposure contours for the 2005 No Action and 2005 Proposed Actions conditions, as well as the areas of increased noise exposure.

Click here for Exhibit 4-3

Click here for Exhibit 4-4

Click here for Exhibit 4-5

Click here for Exhibit 4-6

Table 4-4 summarizes the number of people and acres within the increased noise areas for 2000 and 2005 (Proposed Action) conditions.

Table 4-4
AREAS OF INCREASE FOR PROPOSED ACTION
McCarran International Airport

Condition	1.5 dB Increase within 65 DNL	3.0 dB Increase within 60-65 DNL	5.0 dB Increase within 45-60 DNL
Population			
2000 Proposed Action	7	20	8,255
2005 Proposed Action	0	7	147
Area (Acreage)			
2000 Proposed Action	361	1149	22,090
2005 Proposed Action	234	851	15,907

Source: Landrum & Brown, 2001
Refer to Section 4.2.1 for a discussion of significant and marginal impacts.

1.5 dB Increases

One area along the extended centerlines and west of Runways 7/25 would be exposed to noise increases of 1.5 dB or more within the 65 DNL contour for the 2000 Proposed Action condition. A similar area of 1.5 dB increase would be found in the same location under the 2005 Proposed Action condition. This area would experience an increase in noise exposure under the Proposed Action conditions because the departure routes from Runways 25R/L (going to eastern destinations) would now turn left over more compatible land use areas, instead of turning right over densely populated, non-compatible land use areas. In the 2000 Proposed Action condition, a 1.5 dB increase within the 65 DNL would occur over generally compatible land uses that contain sparsely populated areas. In the 2005 Proposed Action condition, the 1.5 dB increase within 65 DNL, would be over compatible land uses with no populated areas. No mitigation measures would be required for the Proposed Action, because this impact would be temporary in nature, and eliminated over time by the implementation of the Proposed Action.

3.0 dB Increases

Similar to the 1.5 dB increase area described above, one area of 3 dB increase between 60 and 65 DNL of the 2000 and 2005 Proposed Action would be found west of the airport along the departure paths off Runway 25. The reason for this increased noise area is the same as described above for the 1.5 dB increase in the same area.

5.0 dB Increases

There are areas of 5 dB increases between the 45 and 60 DNL contours in a number of areas around the airport. The locations to the west/southwest result from the same relocated flight routes as described above for the 1.5 dB and 3.0 dB increase areas. The 5 dB increases to the north result from relocated and new departures from Runway 25 using the STAAV DP. This area is currently overflown by flights from LAS, and Nellis Air Force Base. To the east of the airport, three areas of 5 dB increase within the 45 to 60 DNL would occur due to the northerly relocation of the MEADE DP (proposed to be renamed WYLDD DP) and the concentration of traffic into a tighter corridor. Under the 2005 Proposed Action condition the 5 dB increase area north of the airport would no longer be present due to the reduction of "hush-kitted" Stage 3 aircraft.

4.2.2.1 Additional Noise Impacts

Exhibit 4-1 and **Exhibit 4-2** depict the existing and proposed arrival and departure flight paths. In addition, specific locations under the flight paths are identified with a letter and values for DNL, number of operations, and average altitude of aircraft are shown. This information is summarized below in **Table 4-5.** A comparison of the No Action and Proposed Action DNL values at the various locations under the flight tracks indicate that in some cases, the noise levels increase. Locations A-1 and D-7 reports a 1.5 dB increases within the 65 DNL, however, these areas are over compatible land uses (refer to Appendix A, Table A-5) and therefore are not considered a significant noise increase. Refer to Section 4.2, *Noise* for a discussion of significant noise impacts.

4.2.3 Proposed Action

For this EA, the Proposed Action condition was assessed for both 2000 and 2005 conditions. The findings indicate that although aircraft noise levels would increase at some locations, the significant noise increase (1.5 dB within the 65 DNL over non-compatible land use) would be temporary in nature (2000 condition only) and would be mitigated through the implementation of the Proposed Action over time. Therefore no further mitigation would be required.

4.2.4 No Action

Implementation of the No Action would result in no changes in existing conditions. No adverse impacts would result and no mitigation measures would be required.

Table 4-5
NOISE LEVELS AT SPECIFIC LOCATIONS UNDER FLIGHT PATHS
McCarran International Airport

Arrivals								
Location	**Latitude**	**Longitude**	**DNL**		**Operations**		**Altitude (MSL)**	
			No Action	**Proposed Action**	**No Action**	**Proposed Action**	**No Action**	**Proposed Action**
A-1	36.073003	-115.245899	64.1	66.5	8	8	4,180’	4,180’
A-2	36.023834	-115.294242	53.1	56.6	154	154	5,780’	5,780’
A-3	36.101671	-115.601217	14.7	7.2	148	148	18,180’	18,180’
A-4	35.919965	-115.397441	43.2	39.4	0	201	N/A	8,180’
A-5	35.765502	-115.588591	19.5	5.1	0	201	N/A	12,180’
A-6	36.287882	-115.290672	16.4	18.7	201	121	8,180’	8,180’
A-7	35.985692	-115.222952	48.4	51.4	172	237	6,080’	6,080’
A-8	35.823051	-115.212078	34.0	36.9	253	282	10,000’	8,180’
A-9	35.934405	-115.127559	38.4	28.2	121	24	11,180’	11,180’
A-10	36.075152	-115.021235	59.4	59.3	140	140	11,680’	11,680’
A-11	35.747203	-114.792678	3.1	0.7	0	264	N/A	12,180’
A-12	36.306739	-114.663294	16.1	3.7	0	140	N/A	10,180’
A-13	36.399094	-115.434057	2.7	2.8	0	7	N/A	12,180’
A-14	36.316462	-115.144982	18.6	44.0	0	7	N/A	8,680’
A-15	36.155996	-115.118062	51.1	54.3	281	311	5,780’	5,780’
A-16	36.158082	-114.995510	44.1	39.5	140	49	7,280’	7,280’
A-17	36.077333	-115.019886	58.5	58.5	223	223	7,280’	7,280’
A-18	36.003001	-114.946085	42.8	32.7	264	153	8,500’	9,180’
A-19	36.011911	-115.146353	43.1	38.0	148	70	8,180’	8,180’
A-20	35.999486	-114.835883	36.4	38.2	120	131	9,500’	10,680’
A-21	35.759227	-114.797984	4.0	1.2	0	264	N/A	14,180’
Departures								
Location	**Latitude**	**Longitude**	**DNL**		**Operations**		**Altitude (MSL)**	
			No Action	**Proposed Action**	**No Action**	**Proposed Action**	**No Action**	**Proposed Action**
D-1	36.186154	-115.169614	44.6	48.0	13	13	5,180’	5,180’
D-2	36.313051	-115.147714	19.0	43.9	0	13	N/A	8,080’
D-3	36.462833	-114.877317	0.7	3.1	0	3	N/A	13,380’
D-4	36.516194	-114.951537	0.5	0.1	0	3	N/A	13,380’
D-5	36.535434	-115.069894	3.6	3.4	0	3	N/A	13,380’
D-6	36.410836	-115.485474	0.4	0.5	0	4	N/A	13,930’
D-7	36.074229	-115.246945	63.6	66.5	353	353	4,180’	4,180’
D-8	36.034633	-115.277150	59.1	61.3	272	294	5,080’	5,080’
D-9	35.932196	-115.350847	49.4	48.7	636	636	7,430’	7,430’
D-10	35.660742	-115.296635	13.0	23.3	302	328	3,280’	3,280’
D-11	35.828629	-115.063921	19.4	32.8	280	308	12,580’	12,580’
D-12	35.857278	-114.574201	2.4	1.4	50	50	20,480’	20,480’
D-13	35.988427	-114.606839	5.6	16.0	0	258	N/A	20,580’
D-14	36.123389	-115.144361	62.7	61.5	117	100	4,180’	4,180’
D-15	36.079607	-114.982918	53.9	54.5	42	51	5,180’	5,180’
D-16	36.138233	-114.952498	37.1	37.5	18	18	7,080’	7,080’
D-17	36.157456	-114.570319	2.9	21.2	0	69	N/A	13,480’
D-18	35.956682	-114.912657	33.0	25.8	25	7	7,430’	7,430’

Note: MSL refer to above Mean Sea Level
Note: < refers to DNL levels less than 20.
Source: Landrum & Brown, 2001.

4.3 DEPARTMENT OF TRANSPORTATION, 4(f)

Section 4(f) in the Department of Transportation (DOT) Act of 1966 protects parks, recreation areas, wildlife and waterfowl areas and historic structures eligible for on listed on the National Register of Historic Places. These areas are known as Section 4(f) lands. Section 4(f) of the DOT Act of 1966 is currently known as 49 USC Section 303(c). The DOT Act of 1966 was one of the earliest and most significant pieces of transportation legislation relative to environmental protection. Under this Act, it is stated that:

> "The Secretary shall not approve any program or project which requires the use of any publicly-owned land from a public park, recreation area, or wildlife and waterfowl refuge or national, state, or local significance as determined by the Federal, State, or local officials having jurisdiction thereof, or any land from an historic structure of national, state, or local significance as so determined by such officials unless:
>
> - There is no feasible and prudent alternative to the use of such land; and,
> - The project includes all possible planning to minimize harm to the land resulting from such use."[7]

The key word in this Act is "use" of Section 4(f) lands. This is interpreted to include outright physical taking as well as other kinds of constructive use that may adversely impact the land. The Act is further interpreted that a proposed project is compatible if it would not affect the normal activity or aesthetic value of a public park, recreation area, refuge, or historic site. Aircraft noise levels which substantially interfere with the use and value of Section 4(f) lands or which restrict the activities normally occurring at those properties would constitute a constructive use of the property. A discussion of aesthetic impacts of the Proposed Action is discussed in Section 4.5, *Visual Impacts*.

Native American lands are potentially impacted according to Section 4(f) because the change in aircraft routes would possibly impair the resource. The only Native American Community in the Las Vegas TRACON includes the Las Vegas Colony (two location, refer to Exhibit 3-5). However, the Moapa Band of the Pauite Native Americans, is located approximately 35 miles northeast of the Las Vegas Valley. Due to the distance from the airport, and the altitude of any overflights, this Native American Community, was not analyzed as a part of this EA. Please refer to Section 4.4 and 4.5 for further discussion regarding the possible impacts to these Native American Communities.

[7] FAA Order 5050.4A, Airport Environmental Handbook. 1985.

Currently, departure routes overfly both Native American Community locations of the Las Vegas Colony. There are no additional routes identified within the Proposed Action that would overfly the Native American Communities; nor are there any increases in operations. Therefore, the Native American Communities will experience no new impacts due to the Proposed Action, and the Communities were not analyzed further.

4.3.1 Proposed Action

The Proposed Action procedures, do over fly national and state parks; i.e., the BEATY STAR over flying Floyd Lamb State Park and the FUZZY 5 STAR over flying Humbolt Toiabe National Park. However, the proposed procedures are not increasing the area exposed from the existing conditions or adding additional areas. Additionally, the Proposed Action does not "take or use" publicly owned land, therefore, No adverse impacts would result, and no mitigation measures are required.

4.3.2 No Action

Implementation of the No Action Alternative would result in no change from existing conditions. No adverse impacts would result and no mitigation measures are required.

4.4 HISTORIC, ARCHITECTURAL, ARCHEOLOGICAL AND CULTURAL RESOURCES

The Criteria of Effect and Adverse Effect, as defined in 36 CFR 800.9 are used to evaluate an undertaking's effect on a historic property. The Criteria states that "an undertaking has an effect on a historic property when the undertaking may alter the characteristics of the property that may qualify the property for inclusion in the National Register" and "when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association."

Potential impacts on cultural resources include direct and indirect impacts. Direct impacts are caused by the action and occur at the same time and place. Indirect impacts occur later in time and/or further removed in distance, but they are still reasonably foreseeable. The physical displacement, demolition, or alteration of a resource is a direct impact. Changes in the use, operation, or character of the resource may either be a direct or indirect impact. The regulations require the lead agency, in consultation with the State Historic Preservation Officer (SHPO), to determine whether that effect is adverse.

Adverse effects include, but are not limited to:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;

- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- Neglect of a property resulting in its deterioration or destruction; and
- Transfer, lease, or sale of the property.

NHPA further states that "…the responsible Federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to any National Historic Landmark, and shall afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking." Finally, the Department of Transportation Act of 1966 stipulates that any undertaking that requires the use of a historic structure shall not be approved without prior demonstration that (1) "there is no prudent and feasible alternative, and (2) the project includes all possible planning to minimize harm to the historic property resulting from such use." If an undertaking is determined to have an adverse effect on properties included in, or eligible for, the National Register, the lead federal agency and the SHPO enter into consultation to identify ways to avoid or reduce the adverse effects. The Advisory Council on Historic Preservation (ACHP) and other interested parties also can participate in the consultation process.

The State of Nevada Historic Preservation Office was notified of the Proposed Action by receipt of the scoping memo, "Notice of Proposed Action", dated January 26, 2001 (refer to Appendix C). The State of Nevada Historic Preservation Office (SHPO) was also notified of the agency's no effect determination by a letter dated May 21, 2001. The SHPO concurred with FAA's determination by their letter dated June 20, 2001. Please refer to Appendix C, *Coordination/Public Involvement.*

The geographic area of the project includes many Native American Reservations and American Indian landmarks. A Tribal Historic Preservation Officer (THPO) can be appointed or designated in accordance with the Act and is the official representative of an Indian tribe for the purposes of Section 106. The Proposed Action does not establish new air traffic routes over Native American Communities, nor does it increase the number of operations over Native American Communities within the Las Vegas TRACON boundaries. Therefore no effects on the Native American Communities are anticipated, and no coordination with the THPO is required.

4.4.1 Proposed Action

Because the Proposed Action utilizes existing flight paths over the Las Vegas Colony Reservation, no adverse impacts would result and no mitigation measures are required.

4.4.2 No Action

Implementation of the No Action Alternative would result in no changes from existing conditions. No adverse impacts would result and no mitigation measures are required.

4.5 VISUAL IMPACTS

Normally, visual impacts are a result of construction, development or even demolition projects. Air traffic routes seldom cause visual impacts except on clear nights where blinking beacons on an aircraft or landing lights become visible. Contrails are often visual impacts occurring during daylight hours when high altitude aircraft produce condensation. This condensation trail (contrail) is a result of water or ice particles forming when the hot air of the jet exhaust mixes with the cold air of the upper atmosphere. This occurs mostly in the upper troposphere and the upper stratosphere (5-6 miles high).

4.5.1 Visual Impacts to National Parks and Recreational Areas

Limited research exists dealing with the impacts of aircraft overflights on visitors to national parks and recreation areas. In 1987, Public law 100-91 directed the National Park Service (NPS) and the U.S. Forest Service to conduct studies of aircraft overflights that might be affecting visitors of national parks and wilderness areas. The Report on Effects of Aircraft Overflights on the National Park System and the Potential Impacts of Aircraft Overflights of National Forest System Wilderness are among the only large-scale studies in which a concerted effort has been made to apply quantitative methods to the problems of measuring outdoor recreationists' reactions to aircraft noise exposure in wilderness type environments, including national parks.[8, 9]

The studies suggest that visitors to a National Park, wilderness area, or wildlife refuge have different expectations and tolerances for intrusions during their visits. In the sense that a wilderness experience should not have any reminder of civilization or society, however slight or brief, aircraft presence, even at a high altitude, would affect this outdoor experience. This same principle stands with Native American visual impacts. In certain situations, the visual presence of aircraft could interfere with tribal ideals and rituals. Rituals, which involve solitude and natural quiet in primitive areas, are impacted by aircraft overflights.

4.5.1.2 Proposed Action

Under the Proposed Action no adverse impacts would result and no mitigation measures are required. The impact that would potentially occur does not linger in the area and is not permanent or impairment, but the potential disruption could have a diminishing effect on the natural area.

[8] National Park Service *Report on Effects of Aircraft Overflights on the National Park System.* U.S. Department of the Interior, National Park Service, July 1995.

[9] U.S. Forest Service, July 1992.

4.5.1.3 No Action

Implementation of the No Action Alternative would result in no changes from existing conditions. No adverse impacts would result and no mitigation measures are required.

4.6 CUMULATIVE IMPACTS

The regulations of the Council on Environmental Quality (40 CFR Section 1508.7 et seq.) requires studying incremental impacts of the proposed action when added to other past, present, and reasonable foreseeable future actions, regardless of what agency (Federal or non-Federal) undertakes such action.

4.6.1 Ivanpah Valley Airport

The Clark County Department of Aviation has begun preliminary planning for a new airport site. Should it become an airport, the Ivanpah Valley Airport may provide a long-term solution to realign airspace and air routes in the Las Vegas Valley.

The environmental impacts of the development of the Ivanpah Valley Airport to date have not been assessed. However, the likely impacts would include increased noise for areas not currently overflown by aircraft, increased air emissions, and the reduction of natural resources such as threatened and endangered species and habitats. These impacts would primarily occur at the site of the proposed airport, which is approximately 20 miles southwest from McCarran International Airport. Finally, because air traffic would be split between LAS and Ivanpah Valley Airport, it is likely that reductions in noise and air emissions would occur at LAS as a result.

4.6.2 Airport Capital Improvement Plan

Over the next few years (2002-2005) McCarran International Airport will experience continual maintenance and repair projects for their runways, taxiways and ramp areas. Numerous terminal repair and construction projects are also programmed for future consideration. However, none of these programmed projects in combination with the Proposed Action would cause additional environmental impacts beyond those disclosed in this document. McCarran International Airport's maintenance and repair projects are independent of the Proposed Action and will be completed irregardless of the approval or disapproval of the Las Vegas Four Corner-Post Plan.

The Henderson Executive Airport (L15) has plans for the realignment of runway 18/36 and the construction of a new parallel runway. These projects will be subject to a separate environmental review prior to construction. That environmental review will take into consideration any potential cumulative impacts resulting from that project as well as the Las Vegas Four Corner-Post Plan, if applicable. Henderson Executive Airport's runway projects are independent of the Proposed Action and will be completed irregardless of the approval or disapproval of the Four Corner-Post Plan.

4.6.3 Summary of Cumulative Impacts

The combination of the development of Ivanpah Valley Airport, the Airport Capital Improvement Program projects, and the Proposed Action of the Las Vegas Four Corner-Post Plan would likely reduce the percentage of flights over the urban areas of the Las Vegas valley while increasing the percentage of flights over the Ivanpah area. Beyond this, there would be no additional impacts beyond those disclosed in this EA.

CHAPTER FIVE

LIST OF PREPARERS

LIST OF PREPARERS

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APPENDIX A

NOISE

Appendix A contains background information associated with noise. This information includes ambient noise measurement locations, route utilization for the No Action and the Proposed Action, and land use compatibility guidelines.

A.1 Background Ambient Noise

In addition to the DNL noise analysis using the INM model presented in Chapter 4, average ambient noise levels (Leq) were measured at ten specific locations in the region. These ambient noise measurements contain all noise recorded at the site including aircraft and non-aircraft events. The measured levels provide the background or baseline noise levels by which any increases in noise exposure resulting from the Proposed Action can be assessed. The average ambient noise levels are described using the Leq noise metric, which is a cumulative noise measurement representing the average noise energy over a given period of time. For example, if measurements are recorded for one hour and then averaged together, the resulting number would represent a one-hour Leq. Unlike DNL, no penalty is applied against noise events occurring during the nighttime hours. **Exhibit A-1** shows the location of the ten monitor sites and **Table A-1** provides the date, time, and geographic location of each monitoring site. The characteristics of each monitoring site are described below:

- **Site 1: Sandy Valley/Ripley** – Generally under proposed SKEBR STAR. This site was located off of Sandy Valley Road near the Sky Ranch Estates Airport. The site was fairly isolated and near an open desert area. Daytime measurements only.
- **Site 2: Mountain Springs** – Generally under proposed SKEBR STAR. Located on Highway 160 near the Blue Diamond area. This site was at the 5,000 foot elevation on an unpaved driveway leading to an unoccupied home. Daytime measurements only.
- **Site 3: Sloan** – Under the proposed WYLDD departure procedure to the southeast and the AACES departure procedure to the northeast. Located south of Las Vegas and west of Interstate 15. The site was near a mine/gravel quarry and a railroad track. Daytime measurements only.
- **Site 4: Arden** – Located south of Las Vegas on Route 160, west of Interstate 15. Near the projected left turns from newly proposed departure procedures. The site was away from the main roads at the beginning of a desert area. Daytime and nighttime measurements.
- **Site 5: Henderson** – Near the proposed LYNSY approach from the southeast. Located on the east-side of Henderson near Highway 146 leading to Lake Mead in a desert area adjacent to a residential neighborhood.

Click here for Exhibit A-1

- **Site 6 Boulder** – Near the proposed LYNSY approach from the southeast and the BLD VOR, a major navigational aid in the area. Located in the Veteran's Memorial Park in Boulder, near the Boulder Airport. Daytime measurements only.

Table A-1
NOISE MONITORING LOCATIONS

Site	Description	Date	Day Hours	Night Hours	Latitude	Longitude
1	Sandy Valley, NV	01/29/01	1302-1332	N/A	33 47.59	115 37.02
2	Mountain Springs, NV	01/29/01	1040-1110	N/A	36 00.85	115 30.24
3	Sloan, NV	01/29/01	1147-1217	N/A	35 56.23	115 12.50
4	Arden, NV	01/29/01	0915-0945	2214-2244	36 01.60	115 14.43
5	Henderson, NV	01/31/01	1004-1034	2200-2230	36 04.24	114 57.32
6	Boulder, NV	01/31/01	1225-1255	N/A	36 56.96	114 50.98
7	Govt. Wash Lake Mead	01/31/01	1052-1122	N/A	36 07.28	114 54.14
8	Floyd Lamb Park	02/01/01	1042-1112	N/A	36 19.15	115 15.99
9	Craig Ranch Golf Course	01/30/01	0901-0931	2212-2242	36 14.68	115 08.70
10	Desert Breeze County Park	01/30/01	1155-1225	2323-2353	35 47.59	115 37.02

Note: Due to the proximity of the sites to developed areas of Nevada, not all sites were measured for night hours.
Source: Landrum & Brown, 2001

- **Site 7: Lake Mead** – Located at the Government Wash near the intersections of Lake Mead Boulevard and Northshore Road. Under the proposed KSINO STAR 20 miles southeast of the airport. Located at a public rest area overlooking a river and a desert area. Near a gated residential area. Daytime measurements only.
- **Site 8: Floyd Lamb State Park** – North of Highway 95, approximately 18 miles northeast of the airport under the proposed STAAV departure procedure to the northwest and north and under the proposed SELDM STAR from the northwest. Located within the park boundaries, daytime measurements only.
- **Site 9: Craig Ranch Golf Course** – Located at the corner of Lone Mountain Road and Commerce Street near a residential area. The site was in an undeveloped area consisting of several acres of desert surroundings. Under the proposed STAAV departure procedure to the northwest and north, and under the proposed SELDM STAR from the northwest. Daytime and nighttime measurements.
- **Site 10: Desert Breeze County Park** – Located in the ballpark area of Desert Breeze near a commercial areas off of Durango Drive.

The results of the noise monitoring indicate that typical daytime ambient noise levels in the region range from 43 Leq near the City of Sloan, Nevada to approximately 60 Leq near the Desert Breeze County Park. Nighttime ambient noise levels were generally quieter due to less activity of all types. **Table A-2** provides a summary of the ambient noise levels at each monitor site, as well as the aircraft portion of the ambient, the projected change in aircraft noise at each site due to the Proposed Action, and the resultant change in noise level at each site with the Proposed Action.

The ambient noise level measured at each site contains all background noise including both aircraft and non-aircraft noise events (A). The INM was used to identify the existing Leq aircraft noise levels (of all background noise levels) at each site (B). This represents the aircraft contribution to the ambient noise level at each location. Similarly, the INM calculated the Leq aircraft noise level at each location with the implementation of the Proposed Action (C). The difference between the existing aircraft noise level and the aircraft noise level with the Proposed Action represents the relative change in aircraft noise level due to the project (D). In order to determine if this change in aircraft noise level would impact the overall ambient noise level, the ambient noise level and the change in aircraft noise level due to the Proposed Action were logarithmically summed (E). It is important to understand that sound energy must be logarithmically summed and that logarithmic addition is not the same as linear addition. For example, Site 7 daytime Leq ambient noise levels (A) of 52.3 Leq were recorded. The aircraft portion (B) of the ambient noise levels is 30.3 Leq. For the 2000 Proposed Action, Site 7 aircraft noise levels would increase to 37.5 Leq (C). The difference between the Proposed Action aircraft noise levels (C) and the Existing aircraft noise levels (B) is 7.2 dB (D). The increase in aircraft noise levels (D) is logarithmically summed with the Existing ambient noise levels (A) and the result remains 52.3 Leq (E).

Table A-3 and **Table A-4** are the route utilization tables for the Proposed Action and the No Action Alternatives for LAS.

Proposed Action

For this EA the Proposed Action condition was assessed for both 2000 and 2005 conditions. Table A-2 includes the results of the Leq noise assessment for both the 2000 and the 2005 Proposed Action conditions. The findings of this analysis indicate that although aircraft noise levels would increase at some locations, at none of the ten monitor locations would the overall ambient noise level be increased by the implementation of the Proposed Action. This finding is true for both 2000 and 2005 Proposed Action conditions. No significant impacts would result and no mitigation measures are required.

Table A-2
MEASURED AND CALCULATED AIRCRAFT NOISE LEVELS AT SELECTED LOCATIONS

Daytime (Leqd)			2000			2005			
Site	**Existing Ambient (A)**	**Existing Aircraft Levels (B)**	**Proposed Action Aircraft Levels (C)**	**Difference in Aircraft Levels (D)**	**Proposed Action Ambient Levels (E)**	**No-Action Aircraft Levels (B)**	**Proposed Action Aircraft Levels (C)**	**Difference in Aircraft Levels (D)**	**Proposed Action Ambient Levels (E)**
1	49.7	11.4	4.2	-7.2	**49.7**	15.9	4.2	-11.7	**49.7**
2	49.8	17.0	12.1	-4.9	**49.8**	19.8	13.1	-6.7	**49.8**
3	58.1	38.1	32.4	-5.7	**58.1**	40.9	33.6	-7.3	**58.1**
4	59.9	51.3	47.1	-4.2	**59.9**	49.4	48.2	-1.2	**59.9**
5	58.7	48.3	49.3	1.0	**58.7**	49.9	51.0	1.1	**58.7**
6	50.1	30.7	14.7	-16.0	**50.1**	24.8	16.0	-8.8	**50.1**
7	52.3	30.3	37.5	7.2	**52.3**	29.1	39.3	10.2	**52.3**
8	43.2	10.1	13.0	2.9	**43.2**	10.9	14.6	3.7	**43.2**
9	54.1	27.1	38.6	11.5	**54.1**	26.8	40.2	13.4	**54.1**
10	60.0	52.8	52.6	-0.2	**60.0**	54.4	52.8	-1.6	**60.0**

Nighttime (Leqn)			2000			2005			
Site	**Existing Ambient (A)**	**Existing Aircraft Levels (B)**	**Proposed Action Aircraft Levels (C)**	**Difference in Aircraft Levels (D)**	**Proposed Action Ambient Levels (E)**	**No-Action Aircraft Levels (B)**	**Proposed Action Aircraft Levels (C)**	**Difference in Aircraft Levels (D)**	**Proposed Action Ambient Levels (E)**
1	N/A	2.2	0.0	-2.2	**N/A**	5.5	0.0	-5.5	**N/A**
2	N/A	14.8	8.8	-6.0	**N/A**	16.9	10.5	-6.4	**N/A**
3	N/A	27.8	27.6	-0.2	**N/A**	30.8	29.0	-1.8	**N/A**
4	53.1	43.5	41.8	-1.7	**53.1**	44.5	43.2	-1.3	**53.1**
5	54.2	45.7	46.4	0.7	**54.2**	47.0	47.9	0.9	**54.2**
6	N/A	19.0	11.2	-7.8	**N/A**	14.4	12.6	-1.8	**N/A**
7	N/A	26.3	35.2	8.9	**N/A**	25.7	36.8	11.1	**N/A**
8	N/A	7.7	13.2	5.5	**N/A**	10.2	14.8	4.6	**N/A**
9	N/A	23.7	39.8	16.1	**N/A**	26.1	41.5	15.4	**N/A**
10	N/A	44.1	43.9	-0.2	**N/A**	45.0	42.7	-2.3	**N/A**

Legend: Leqd represents daytime (7:00 a.m. – 9:59 p.m.) Leq noise levels.
Leqn represents nighttime (10:00 p.m. – 6:59 a.m.) Leq noise levels.
Source: Landrum & Brown measurements and INM computations, February, 2001

No Action

Implementation of the No Action Alternative would result in no change from existing conditions for both 2000 and 2005. No adverse impacts would result and no mitigation measures are required.

Table A-5 of this Appendix describes compatible land use information as adopted by FAR Part 150, Airport Noise Compatibility Planning.

Table A-3
Route Utilization -- No Action Alternative
Las Vegas McCarran International Airport

AIRCRAFT	ARRIVALS								DEPARTURES													
INM	CRESO		FUZZY		NOOTN		PEACH SPRINGS		Stage	MEAD - Southwest		OASYS/REDROCK - Southwest		OASYS/REDROCK - Northwest		OVETO - Northeast		MEAD/EBERT - Southeast		OASYS/REDROCK - Southeast	
TYPE	Day	Night	Day	Night	Day	Night	Day	Night	Length	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
727EM2	27.7%	25.0%	20.9%	25.0%	32.7%	31.3%	18.7%	18.8%	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
									2	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
									3	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
									4	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
737400	27.7%	25.0%	20.9%	25.0%	32.7%	31.3%	18.7%	18.8%	1	6.8%	7.1%	21.9%	15.0%	27.7%	25.8%	26.5%	33.5%	10.6%	11.4%	6.5%	7.2%
									2	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
									3	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
									4	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
737N17	27.7%	0.0%	20.9%	0.0%	32.8%	0.0%	18.7%	0.0%	2	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
74720B	27.7%	0.0%	20.9%	0.0%	32.7%	0.0%	18.7%	0.0%	6	0.0%	0.0%	2.1%	0.0%	37.5%	0.0%	26.5%	0.0%	17.4%	0.0%	16.6%	0.0%
757RR	27.7%	25.0%	20.9%	25.0%	32.7%	31.2%	18.7%	18.7%	1	6.8%	7.1%	21.9%	15.0%	27.7%	25.8%	26.5%	33.5%	10.6%	11.4%	6.5%	7.2%
									2	0.0%	0.0%	0.6%	0.0%	38.2%	0.0%	26.5%	0.0%	17.4%	0.0%	17.3%	0.0%
									3	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
									5	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
767300	27.7%	25.0%	20.9%	25.0%	32.7%	31.2%	18.7%	18.7%	1	6.8%	7.1%	21.9%	15.0%	27.7%	25.8%	26.5%	33.5%	10.6%	11.4%	6.6%	7.2%
									3	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
									4	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
A310	27.7%	25.0%	20.9%	25.0%	32.7%	31.3%	18.7%	18.8%	4	0.0%	0.0%	0.6%	0.0%	38.2%	0.0%	26.5%	0.0%	17.4%	0.0%	17.3%	0.0%
A320	27.7%	25.0%	20.9%	25.0%	32.7%	31.3%	18.7%	18.8%	1	6.8%	7.1%	21.9%	15.0%	27.7%	25.8%	26.5%	33.5%	10.6%	11.4%	6.5%	7.2%
									2	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
									3	0.0%	0.0%	0.6%	0.0%	38.2%	0.0%	26.5%	0.0%	17.4%	0.0%	17.3%	0.0%
									4	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
CL601	0.0%	25.0%	0.0%	25.0%	0.0%	31.2%	0.0%	18.7%	1	2.3%	2.3%	39.4%	39.4%	34.2%	34.2%	3.3%	3.3%	15.4%	15.4%	5.5%	5.5%
DC1030	27.7%	0.0%	20.9%	0.0%	32.7%	0.0%	18.7%	0.0%	1	0.0%	7.1%	0.0%	15.0%	0.0%	25.8%	0.0%	33.4%	0.0%	11.3%	0.0%	7.2%
									4	2.3%	2.3%	39.4%	39.4%	34.2%	34.2%	3.3%	3.3%	15.4%	15.4%	5.5%	5.5%
DC93LW	0.0%	25.0%	0.0%	25.0%	0.0%	31.3%	0.0%	18.8%	1	2.3%	2.3%	39.4%	39.3%	34.2%	34.2%	3.3%	3.3%	15.4%	15.4%	5.5%	5.5%
F16A	27.7%	0.0%	20.9%	0.0%	32.7%	0.0%	18.7%	0.0%	1	6.8%	0.0%	21.9%	0.0%	27.7%	0.0%	26.5%	0.0%	10.6%	0.0%	6.6%	0.0%
L1011	27.9%	0.0%	21.1%	0.0%	32.2%	0.0%	18.8%	0.0%	3	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
LEAR35	11.2%	11.2%	24.0%	24.0%	10.1%	10.1%	54.8%	54.8%	1	6.8%	0.0%	21.9%	0.0%	27.7%	0.0%	26.5%	0.0%	10.6%	0.0%	6.6%	0.0%
MD11GE	27.7%	25.0%	20.9%	25.0%	32.7%	31.3%	18.7%	18.8%	4	2.3%	0.0%	39.4%	0.0%	34.1%	0.0%	3.3%	0.0%	15.4%	0.0%	5.5%	0.0%
MD83	27.7%	25.0%	20.9%	25.0%	32.7%	31.3%	18.7%	18.8%	1	0.0%	2.3%	0.0%	39.4%	0.0%	34.1%	0.0%	3.3%	0.0%	15.4%	0.0%	5.5%
									2	6.8%	0.0%	21.9%	0.0%	27.7%	0.0%	26.5%	0.0%	10.6%	0.0%	6.5%	0.0%
									3	2.3%	0.0%	39.4%	0.0%	34.2%	0.0%	3.3%	0.0%	15.4%	0.0%	5.5%	0.0%
									4	0.0%	0.0%	0.6%	0.0%	38.2%	0.0%	26.5%	0.0%	17.4%	0.0%	17.3%	0.0%
MD9025	27.7%	0.0%	20.9%	0.0%	32.7%	0.0%	18.7%	0.0%	1	2.3%	2.3%	39.4%	39.4%	34.2%	34.2%	3.4%	3.4%	15.4%	15.4%	5.5%	5.5%
									2	0.0%	0.0%	0.6%	0.0%	38.2%	0.0%	26.5%	0.0%	17.4%	0.0%	17.3%	0.0%
BEC58P	10.1%	10.2%	24.0%	23.9%	11.1%	11.1%	54.8%	54.8%	1	6.8%	7.1%	21.9%	15.0%	27.7%	25.8%	26.5%	33.5%	10.6%	11.4%	6.5%	7.2%
CNA441	10.1%	10.1%	24.0%	24.0%	11.1%	11.1%	54.8%	54.8%	1	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
COMSEP	10.2%	10.1%	24.0%	24.0%	11.1%	11.1%	54.8%	54.8%	1	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
DHC6	10.1%	10.1%	24.0%	24.0%	11.1%	11.1%	54.8%	54.8%	1	0.0%	0.0%	0.6%	0.6%	38.2%	25.8%	26.5%	33.5%	17.4%	18.5%	17.3%	21.6%
DHC8	0.0%	10.1%	0.0%	24.0%	0.0%	11.1%	0.0%	54.8%	1	6.8%	0.0%	21.9%	0.0%	27.7%	0.0%	26.5%	0.0%	10.6%	0.0%	6.6%	0.0%
HS748A	11.2%	11.2%	24.0%	23.9%	10.1%	10.0%	54.8%	54.8%	1	0.0%	0.0%	0.6%	0.0%	38.2%	0.0%	26.5%	0.0%	17.4%	0.0%	17.3%	0.0%
SF340	11.2%	0.0%	24.0%	0.0%	10.0%	0.0%	54.8%	0.0%	1	2.3%	0.0%	39.4%	0.0%	34.2%	0.0%	3.3%	0.0%	15.4%	0.0%	5.5%	0.0%

Source: Landrum & Brown Assessment of flight activity, existing schedules and city pairs.

Table A-4
Route Utilization -- Proposed Action Alternative
Las Vegas McCarran International Airport

AIRCRAFT INM TYPE	ARRIVALS										Departures													
	BEATY		FUZZY		KSINO		MIROK		SKEBR		Stage Length	AACES		IDALE - BTY		IDALE - HEC		IDALE - TNP		STAAV		WYLDD	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night		Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
727EM2	0.0%	0.0%	0.9%	0.0%	43.4%	61.5%	55.7%	38.5%	0.0%	0.0%	1	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	20.0%	0.0%	60.0%	100.0%	0.0%	0.0%
											2	11.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	13.9%	0.0%	75.0%	100.0%
											3	4.8%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%	20.0%	61.9%	60.0%
											4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.7%	100.0%	42.3%	0.0%
737400	1.9%	0.0%	20.8%	54.9%	15.3%	11.9%	33.1%	32.1%	28.8%	1.0%	1	10.3%	17.8%	23.7%	16.1%	33.9%	35.6%	10.6%	5.1%	0.0%	0.0%	21.5%	25.4%
											2	29.9%	18.5%	23.6%	31.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	46.5%	50.0%
											3	12.8%	15.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	87.2%	84.4%
											4	57.6%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	42.4%	99.7%
737N17	0.0%	0.0%	49.0%	42.1%	19.4%	10.5%	13.3%	47.4%	18.4%	0.0%	2	54.5%	0.0%	0.0%	18.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.5%	81.8%
74720B	0.0%	0.0%	62.5%	100.0%	25.0%	0.0%	12.5%	0.0%	0.0%	0.0%	6	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%
757RR	6.3%	0.0%	5.0%	15.5%	28.3%	28.4%	49.0%	50.9%	11.3%	5.2%	1	5.3%	21.4%	24.0%	14.3%	34.0%	50.0%	4.7%	0.0%	0.0%	0.0%	32.0%	14.3%
											2	5.9%	0.0%	19.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	74.5%	100.0%
											3	54.6%	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.4%	95.2%
											5	66.7%	66.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%	33.3%
767300	0.0%	0.0%	0.0%	0.0%	46.7%	26.7%	53.3%	73.3%	0.0%	0.0%	1	76.2%	60.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	23.8%	40.0%
											3	100.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%
											4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
A310	0.0%	0.0%	25.0%	0.0%	12.5%	0.0%	62.5%	100.0%	0.0%	0.0%	4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
A320	0.0%	0.0%	20.0%	10.9%	27.6%	30.0%	46.7%	59.1%	5.8%	0.0%	1	1.4%	42.1%	28.8%	0.0%	21.9%	10.5%	8.2%	2.6%	0.0%	0.0%	39.7%	44.7%
											2	33.3%	100.0%	66.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
											3	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	100.0%
											4	66.3%	30.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.7%	69.8%
CL601	0.0%	0.0%	85.7%	0.0%	0.0%	0.0%	14.3%	100.0%	0.0%	0.0%	1	0.0%	62.5%	50.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	37.5%
DC1030	0.0%	0.0%	0.0%	33.3%	50.0%	66.7%	13.9%	0.0%	36.1%	0.0%	1	11.1%	11.1%	0.0%	0.0%	88.9%	88.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
											4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
DC93LW	0.0%	0.0%	49.0%	42.1%	19.4%	10.5%	13.3%	47.4%	18.4%	0.0%	1	5.1%	60.0%	56.4%	20.0%	17.9%	0.0%	1.3%	5.0%	0.0%	0.0%	19.2%	15.0%
F16A	0.0%	0.0%	10.6%	60.0%	15.3%	0.0%	22.4%	40.0%	51.8%	0.0%	1	8.6%	20.0%	14.8%	0.0%	29.6%	70.0%	14.8%	0.0%	9.9%	0.0%	22.2%	10.0%
L1011	0.0%	0.0%	0.0%	33.3%	50.0%	66.7%	13.9%	0.0%	36.1%	0.0%	3	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
LEAR35	0.0%	0.0%	18.0%	43.8%	15.0%	6.3%	31.7%	43.8%	35.4%	6.3%	1	18.6%	18.2%	15.7%	21.2%	21.5%	24.2%	15.2%	6.1%	1.8%	0.0%	27.0%	30.3%
MD11GE	0.0%	0.0%	0.0%	33.3%	50.0%	66.7%	13.9%	0.0%	36.1%	0.0%	4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
MD83	0.0%	0.0%	22.1%	25.0%	12.0%	20.0%	42.3%	55.0%	23.6%	0.0%	1	6.4%	50.0%	6.4%	0.0%	86.2%	50.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%
											2	0.0%	12.5%	31.5%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	68.5%	62.5%
											3	58.1%	9.5%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	39.5%	90.5%
											4	42.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.1%	100.0%
MD9025	0.0%	0.0%	22.1%	25.0%	12.0%	20.0%	42.3%	55.0%	23.6%	0.0%	1	6.4%	50.0%	6.4%	0.0%	86.2%	50.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%
											2	0.0%	12.5%	31.5%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	68.5%	62.5%
BEC58P	0.0%	0.0%	18.6%	66.7%	15.1%	0.0%	26.7%	33.3%	39.5%	0.0%	1	11.6%	11.6%	20.9%	20.9%	9.3%	9.3%	14.0%	14.0%	0.0%	0.0%	44.2%	44.2%
CNA441	0.0%	0.0%	24.0%	7.1%	13.6%	57.1%	26.0%	35.7%	36.4%	0.0%	1	13.7%	21.4%	28.2%	57.1%	14.5%	7.1%	17.9%	7.1%	0.0%	0.0%	25.6%	7.1%
COMSEP	0.0%	0.0%	6.2%	20.0%	20.9%	80.0%	28.7%	0.0%	44.2%	0.0%	1	23.4%	57.1%	10.9%	14.3%	29.7%	0.0%	20.3%	14.3%	0.0%	0.0%	15.6%	14.3%
DHC6	0.0%	0.0%	7.7%	7.7%	7.7%	7.7%	0.0%	0.0%	84.6%	84.6%	1	11.1%	11.1%	59.3%	59.3%	3.7%	3.7%	25.9%	25.9%	0.0%	0.0%	0.0%	0.0%
DHC8	0.0%	0.0%	5.7%	5.7%	0.0%	0.0%	88.6%	88.6%	5.7%	5.7%	1	5.4%	0.0%	8.1%	0.0%	2.7%	0.0%	0.0%	0.0%	0.0%	0.0%	83.8%	100.0%
HS748A	0.0%	0.0%	5.7%	5.7%	0.0%	0.0%	88.6%	88.6%	5.7%	5.7%	1	5.4%	0.0%	8.1%	0.0%	2.7%	0.0%	0.0%	0.0%	0.0%	0.0%	83.8%	100.0%
SF340	0.0%	0.0%	7.7%	7.7%	7.7%	7.7%	0.0%	0.0%	84.6%	84.6%	1	11.1%	11.1%	59.3%	59.3%	3.7%	3.7%	25.9%	25.9%	0.0%	0.0%	0.0%	0.0%

Source: Landrum & Brown Assessment of flight activity, existing schedules and city pairs.

Table A-5
LAND USE COMPATIBILITY WITH
YEARLY DAY-NIGHT AVERAGE SOUND LEVEL IN DECIBELS

LAND USE	Yearly day-night average level (Ldn) in decibels					
	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, hospitals, 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]	N[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
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
production, and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y	Y[5]	N[5]	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

Table A-5 (continued)
LAND USE COMPATIBILITY GUIDELINES

The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Key To Table A-5

Y (Yes)Land Use and related structures compatible without restrictions.

N (No) Land Use and related structures are not compatible and should be prohibited.

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, 35 Land Use and related structures generally compatible; measures to achieve or NLR of 25, 30, or 35dB must be incorporated into design and construction of structure.

Notes for Table A-5

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 25dB and 30dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR or 20dB, thus, the reduction requirements are often stated as 5, 10, or 15dB 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 of 25dB 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 30dB 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 of 35dB 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.
5. Land use compatible provided special sound reinforcement systems are installed.
6. Residential buildings require a NLR of 25.
7. Residential buildings require a NLR of 30.
8. Residential buildings not permitted.

Source: *FAR Part 150 Airport Noise Compatibility Planning*, Appendix A,

APPENDIX B

RESPONSE TO THE DRAFT EA

As a result of the Draft Environmental Assessment, dated April 2001, the following agencies and interested parties submitted comment letters:

- Department of Aviation, McCarran International Airport
- City of Henderson
- City of Las Vegas, Planning and Development Department, Comprehensive Planning Division
- Robert Hall and the Nevada Environmental Coalition Inc. (NEC)

Appendix B provides a copy of the comment letters received and the FAA's response to each comment included in the comment letters.

P:\Northwest 2000\EA's PHX and LAS\LAS\Final EA\LAS - APP A - RESPONSE TO DRAFT.doc

Response to the City of Las Vegas, Planning and Development Department

All comments and edits from the City of Las Vegas, Planning and Development Department, Comprehensive Planning Division are reflected in the Final EA.

APPENDIX C
COORDINATION / PUBLIC INVOLVEMENT

A leading element in the environmental process is the provision for public input into the decision-making forum concerning airport development. The Draft Environmental Assessment (EA) was available to the public at locations listed in Appendix E, *Distribution List*. To allow the public an opportunity to present their perspectives on the analysis contained in the Draft EA, a series of public meetings/workshops was conducted.

PUBLIC INFORMATION WORKSHOPS

The public information workshops provided the public with the opportunity to become informed about the project, participate in one-on-one discussions with the FAA and the FAA's consultants, and to closely review the related maps and exhibits and status of the environmental analysis.

Four public information workshops for the Draft EA were conducted and are listed below:

Monday, April 30, 2001 – 6:00 p.m. – 8:00 p.m.:
Community College of Southern Nevada
Boulder City Campus
700 Wyoming Drive
B1A
Boulder City, NV 89005-2706

Tuesday, May 1, 2001 – 6:00 p.m. – 8:00 p.m.:
Community College of Southern Nevada
Henderson Campus
700 College Drive
111B
Henderson, NV 89015

Wednesday, May 2, 2001 – 6:00 p.m. – 8:00 p.m.:
Grant Sawyer Middle School
5450 Redwood Street
Las Vegas, NV 89118

Thursday, May 3, 2001 – 6:00 p.m. – 8:00 p.m.:
Reynaldo Martinez Elementary School
350 E. Judson Avenue
North Las Vegas, NV 89030

A copy of the sign-in sheets and handouts used for these public information meetings are included in this Appendix along with the affidavit of publication for the meeting notice printed in The Las Vegas Review-Journal and The Las Vegas Sun.

A 45-day comment period for the public to comment on the project and process was open from April 16, 2001 through May 30, 2001. A copy of the comments received is located in Appendix B, *Response to the Draft EA*, of this document.

This Appendix also includes coordination with the State Historic Preservation Office and the Clark County Board of Commissioners.

PUBLIC WORKSHOP MATERIALS

Affidavits of Publication
Handout
Sign In Sheets

COORDINATION LETTERS

APPENDIX D

RESPONSE TO THE NOTICE OF PROPOSED ACTION

As a result of the Notice of the Proposed Action, dated January 26, 2001, the following agencies and interested parties submitted comment letters:

- Department of Aviation, McCarran International Airport
- Department of Administration, State of Nevada
- United States Department of Interior, Fish and Wildlife Service, Nevada Fish and Wildlife Office

This appendix includes the Notice of Proposed Action and the comment letter listed above.

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APPENDIX E
DISTRIBUTION LIST

In accordance with 301 CMR 11.16, the Las Vegas Four Corner-Post Plan EA is being distributed to the following parties listed below

Refers to a notice of availability sent to the receiver. All others will be sent the full document.

Individuals and Agencies

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McCarran International Airport
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Las Vegas, NV 89111-1005

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Department of Conversation and Natural Resources
Division of Environmental Protection
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Carson City, NV 89710

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State Historic Preservation Officer
State of Nevada
Department of Conservation and Natural Resources
Division of Historic Preservation and Archaeology
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Henderson Planning Dept.
240 Water Street
Henderson, NV 89104

Walter Cairns
Las Vegas Community Planning
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Blm. LVDO Inter-Governmental Relations
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Las Vegas, NV 89108

Terri Barber
Director of Gov't Relations
50 Nevada Home Builders
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Dennis Mewshaw, Principal Planner
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Steve Baxter
Community Planning & Development
City of North Las Vegas
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City of Las Vegas
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Las Vegas, NV 89101

Michael L. Montandon, Mayor
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North Las Vegas, NV 89030

Jim Gibson, Mayor
City of Henderson
240 Water St.
Henderson, NV 89015

Robert Ferraro, Mayor
City of Boulder City
401 California Ave.
Boulder City, NV 89005

Las Vegas Colony & Reservation
No. 1 Paiute Tribe
Las Vegas, NV 89106

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Government Center
500 South Grand Central Parkway
Las Vegas, NV 89155

Myrna Williams
Commission District E
Clark County Board of Commissioners
Government Center
500 South Grand Central Parkway
Las Vegas, NV 89155

Erin Kenny
Commission District F
Clark County Board of Commissioners
Government Center
500 South Grand Central Parkway
Las Vegas, NV 89155

Dario Herrera
Commission District G
Clark County Board of Commissioners
Government Center
500 South Grand Central Parkway
Las Vegas, NV 89155

Libraries

Clark County Law Library
309 S. 3rd Street Floor 4
Las Vegas, NV 89101-6001

Clark County Library
1401 E. Flamingo Road
Las Vegas, NV 89119-5265

Enterprise Library
25 E. Shelbourne Avenue
Las Vegas, NV 89123-2139

Las Vegas Branch Gnlgcl Library
509 S. 9th Street
Las Vegas, NV 89101-7010

Las Vegas Library
833 Las Vegas Boulevard N
Las Vegas, NV 89101-2004

Mt. Charleston Public Library
1252 Aspen Avenue
Las Vegas, NV 89124Rainbow Library
3150 N. Buffalo Drive
Las Vegas, NV 89128-2823

Sahara West Library
9600 W. Sahara Avenue
Las Vegas, NV 89117-5959

Spring Valley Library
4280 S. Jones Boulevard
Las Vegas, NV 89103-3325

Summerlin Library
1771 Inner Circle
Las Vegas, NV 89134-6119

Sunrise Library
5400 Harris Avenue
Las Vegas, NV 89110-2543

West Charleston Library
6301 W. Charleston Boulevard
Las Vegas, NV 89146-1124

West Las Vegas Library
951 W. Lake Mead Boulevard
Las Vegas, NV 89106-2315

Whitney Library
5175 E. Tropicana Avenue
Las Vegas, NV 89122-6742

Green Valley Library
2797 N. Green Valley Pkwy.
Henderson, NV 89014-0200

Henderson Library
1608 Moser Drive
Henderson, NV 89015-4330

Henderson Public Library
280 S. Water St.
Henderson, NV 89015-7288

Henderson Public Library
80 N. Pecos Road #H
Henderson, NV 89014-3379

Boulder City Library
813 Arizona St.
Boulder City, NV 89005-2603