Project Definition and Justification

Proposal to Construct and Operate a New Supplemental Commercial Service Airport in the Ivanpah Valley

Clark County Department of Aviation

August 2006

TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

1 EXECUTIVE SUMMARY

The Clark County Department of Aviation (CCDOA) owns and operates a system of airports, which, collectively, accommodates the commercial service, general aviation, sport aviation, and air cargo demands within southern Nevada. The principal commercial service airport is McCarran International Airport (LAS), which is currently the primary aviation gateway to the Las Vegas metropolitan area.[1]

The number of annual commercial service operations has increased dramatically at LAS over the last decade. The increased demand for commercial service to the Las Vegas metropolitan area is largely a result of the rapid growth in the gaming and entertainment industries that dominate the Las Vegas economy, in addition to the rapid increase in population of the region. Because the regional economy is driven by tourism and the convention business, the ability of the regional airport system to provide unconstrained commercial service is vital to the economic well-being of the metropolitan area. Toward that end, CCDOA's chief objective is to ensure that the economic health and development of the Las Vegas metropolitan area is never impeded by a lack of sufficient commercial air service capacity.

The projected unconstrained growth in aviation demand for the metropolitan area far exceeds the available capacity, however. The 2005 FAA-approved forecast for unconstrained aviation activity at LAS (Unconstrained Forecast)[2] predicts over 32,500,000 enplaned passengers for the metropolitan area in 2025 – a fifty percent increase from the number of enplaned passengers in 2005 (*i.e.*, just over 21,975,000). At this rate, CCDOA has calculated that LAS will reach its practical capacity - defined by FAA as the point at which an airport experiences an average annual delay of 20 minutes per operation – by 2018 or 2019. As delays reach this level, the ability of LAS to accommodate increasing levels of traffic would be constrained and air carrier passenger and operations activity would, in fact, reach an ultimate cap. Given the fact that LAS can only accommodate about a decade more of growth if no action is taken, and given the lead time necessary for planning, design, and federal approval of any capacity-enhancing options, the need for action to accommodate forecasted growth is both evident and urgent.

LAS cannot be expanded in a manner that will be sufficient to accommodate this long-term commercial service demand. Unlike the isolated airport of decades past, LAS is now an urban airport, hemmed in by thriving business districts, flourishing housing developments, and severely constrained airspace.

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1 The Las Vegas metropolitan area, located within the Las Vegas Valley, is a 600 square mile (1,600km^2) basin that is part of Clark County in southern Nevada. The area contains the largest concentration of people in the state. The Las Vegas metropolitan area is defined by the Spring Mountains on the west, Sheep Mountains to the north, Muddy Mountains, Eldorado Range and Lake Mead to the east, and the Black Mountains to the south. The Las Vegas metropolitan area also includes Boulder City and Blue Diamond. Even though they are not within the Las Vegas Valley, these cities are generally considered to be part of the greater metropolitan area. The boundaries of the Las Vegas metropolitan area are depicted in **Figure 1-1**.

2 URS, Forecast of Commercial Service Airport Activity in the Las Vegas Metropolitan Area (2005).

Furthermore, the expansion of other airports in the regional system is not a prudent or feasible solution to the problem. CCDOA has carefully developed its airport system to maximize its commercial air service capacity while accommodating the entire regional aviation need. Each airport in the system has a specific function within the regional plan. Toward that end, expansion of commercial service to any of the other airports in the regional system would be inefficient: it would displace the existing uses and existing activities for which those airports have been developed and would require the associated development of other facilities to accommodate the displaced facility and activities in order to maintain overall system-wide capacity.

Construction of a new supplemental commercial service airport is necessary, therefore, to ensure that there is never a lack of commercial air service capacity to serve the economic center of Las Vegas. The Department of Defense reserves much of the airspace north of the metropolitan area for military operations. Civil use, therefore, is severely constrained. As a result, CCDOA has determined that the only practical sites for locating a new supplemental commercial service airport are located south of the metropolitan area.

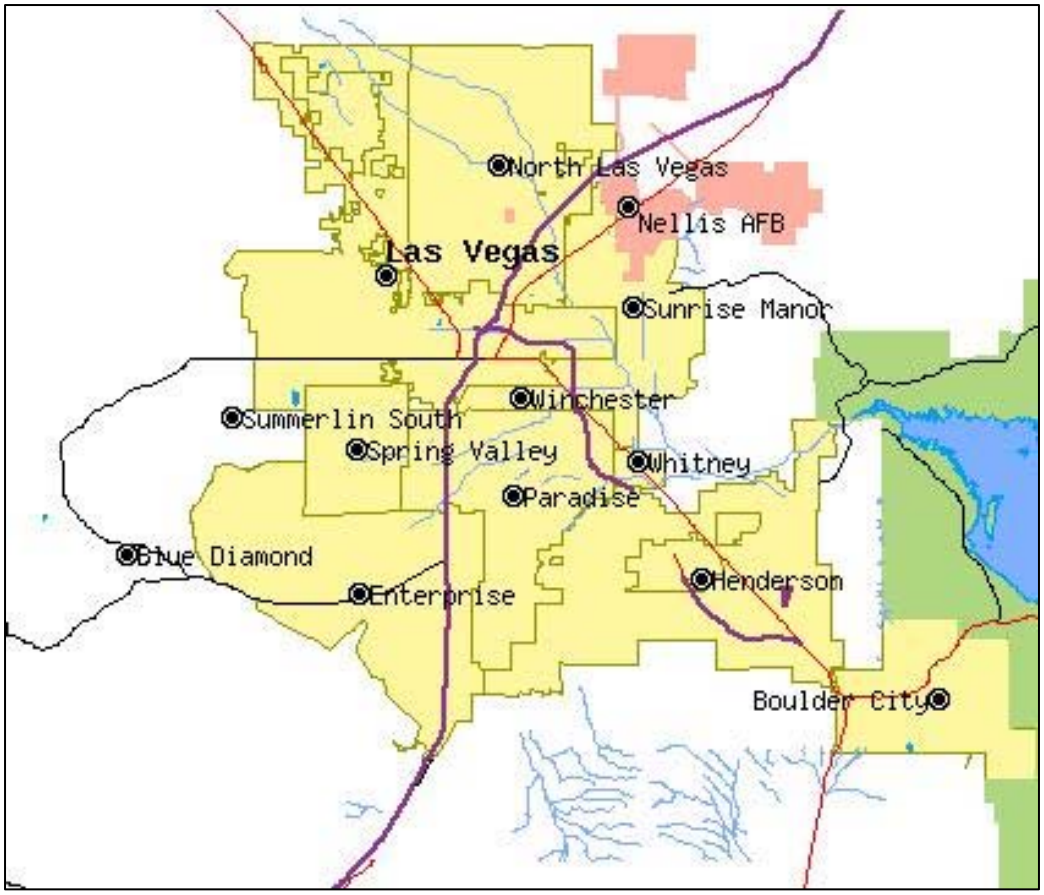
Having evaluated in depth the possible locations for a new commercial service airport, CCDOA has concluded that the most viable site is in the Ivanpah Valley. The site is located a sufficient distance from surrounding mountains to allow for a north-south complex of parallel runways. The site is also surrounded by adequate airspace, could accommodate the necessary full precision instrument approaches, and would avoid conflict with air traffic at LAS, Nellis Air Force Base, and other airports in the region. Finally, the site is less than 30 miles south of Las Vegas, and is in close proximity to existing jet fuel pipelines, as well as U.S. Interstate I-15 and the Union Pacific Railroad, which enhance logistics, intermodal transportation, and cargo opportunities.

CCDOA undertook a site evaluation study to determine the suitability of the Ivanpah site for the proposed new supplemental airport and to determine if there were any other potentially viable alternative sites. That study identified several candidate locations, but concluded that the Ivanpah site appeared to best serve the needs of Clark County at an acceptable cost and with fewer social, community, and environmental impacts.[3]

As a result, CCDOA has proposed to construct a new supplemental commercial airport in the Ivanpah Valley in order to accommodate future commercial service demand for the Las Vegas metropolitan area (the Proposed Action).

[3] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005); CCDOA, Technical Memorandum: Supplement to the 2005 Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).

FIGURE 1-1
BOUNDARIES OF THE LAS VEGAS METROPOLITAN AREA



Source: CCDOA (2006)

2 CCDOA GOALS AND OBJECTIVES

CCDOA's goal is to ensure that the economic health and development of the Las Vegas metropolitan area is never impeded by a lack of sufficient commercial air service capacity.[4] Based on the known aviation needs in the Las Vegas metropolitan area, the long-term regional planning considerations, and the projected future demands for aviation service, Clark County has identified the following objectives as critical to achieving its goal:[5]

(1) To ensure sufficient long-term commercial air service capacity;

(2) To enable the continued economic development of the Las Vegas metropolitan area;

(3) To accommodate airport users with the best possible facilities and service;

(4) To plan future aviation development that is consistent with local and regional land use planning and that enhances compatibility of the existing facilities;

(5) To plan future aviation development that is consistent with the regional airport system plan and that enhances efficiency of the entire airport system;

(6) To maximize the utility of airspace and enhance air traffic safety and efficiency;

(7) To minimize current and future aircraft delay (particularly at McCarran International Airport), thereby minimizing the associated environmental, economic, and financial effects of that delay; and

(8) To identify new sites for potential long-term development of commercial service.

Overall, CCDOA's goal and its related objectives define the bases for CCDOA's proposal to construct and operate a new supplemental commercial service airport in the Ivanpah Valley. Specifically, the purpose of CCDOA's Proposed Action, *i.e.*, the construction and operation of a new supplemental commercial service airport in the Ivanpah Valley, is to meet these needs.

2.1 ENSURE SUFFICIENT LONG-TERM COMMERCIAL AIR SERVICE CAPACITY FOR THE LAS VEGAS METROPOLITAN AREA

Las Vegas has been one of the nation's fastest growing metropolitan areas for more than a decade, and aviation demand has increased accordingly. The Unconstrained Forecast predicts an average growth rate of 2.7 percent per year from the 2005 level of approximately 380,000 air carrier and commuter operations and 553,000 total operations.[6] If growth at LAS were not constrained, the demand by 2025 would exceed 633,000 air carrier and commuter operations and

[4] Testimony of D. Mewshaw, Hearing on H.R. 1695, the Ivanpah Valley Airport Public Lands Transfer Act; Hearing before the House Resources Subcommittee on National Parks and Public Lands (1999); *see also* CCDOA, Presentation to FAA Regional Management Team (2005).

[5] HNTB, Southern Nevada Regional Airport System Plan (2006).

[6] URS, Forecast of Commercial Service Airport Activity in the Las Vegas Metropolitan Area (2005).

922,000 total operations: *i.e., a 67 percent increase in both air carrier and commuter operations and total operations in just 20 years.*

The existing airport is simply not designed to accommodate this level of activity. In fact, FAA has identified LAS as one of the airports that will run out of capacity by 2020.[7] Toward that end, it is CCDOA's objective to provide long-term commercial air service capacity for the Las Vegas metropolitan area.

2.2 ENABLE THE CONTINUED ECONOMIC DEVELOPMENT OF THE LAS VEGAS METROPOLITAN AREA

Because the Las Vegas economy is driven by tourism and the convention business, CCDOA's ability to provide unconstrained commercial service is vital to the economic well-being of the metropolitan area.

LAS, which is the primary commercial service airport in the metropolitan area, plays a substantial role in sustaining the Las Vegas economy. The Center for Business and Economic Research at the University of Nevada, Las Vegas (UNLV) published a study in 2005 that examined the economic impact of commercial aviation service to Clark County. That study concluded that the impact of commercial aviation service to the metropolitan economy is two-fold. First, operations at LAS have *primary impacts*, *i.e.*, they create direct economic activity in the metropolitan area, including airport employment, increased business for area firms, local expenditures by visitors, and economic benefits to residents. Second, operations at LAS also have *indirect*, or *spinoff impacts*. For example, the economic activity at LAS provides income directly to local workers, who then participate in economic activity of their own through consumption and investment.[8]

The UNLV study calculated that the *primary* economic impacts alone from all commercial service to the metropolitan area (occurring at LAS, North Las Vegas Airport and Henderson Executive Airport) total more than $7 billion *annually*.[9] (*See* **Table 2-1**). The study also calculated that commercial aviation produces an additional $20.59 billion in spinoff spending, for a total quantitative economic impact to Clark County of approximately $27.87 billion annually.[10] The *total* economic benefits from the tourism industry are even greater. The Las Vegas Convention and Visitors Authority (LVCVA) calculates that the total economic impact of

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7 FAA, *Capacity Needs in the National Airspace System: An Analysis of Airport and Metropolitan Area Demand and Operational Capacity in the Future* (2005).

8 Bengte Evenson and R. Keith Schwer, UNLV, Clark County Airport System Impact Study: 2004-2005 (2005).

9 Bengte Evenson and R. Keith Schwer, UNLV, Clark County Airport System Impact Study: 2004-2005 (2005). Note that the study accounted for the fact that some of the benefit leaks out to other economies through the purchase of non-local goods and services sold by local businesses to Las Vegas visitors. Therefore, the study used the International Planning and Analysis Center (IPAC) estimate of 50 percent actual benefit.

10 Bengte Evenson and R. Keith Schwer, UNLV, Clark County Airport System Impact Study: 2004-2005 (2005).

tourism to the Las Vegas metropolitan area was $33.7 billion in 2004 and rose to $36.7 billion in 2005.[11]

TABLE 2-1
TOTAL ESTIMATED PRIMARY IMPACT OF CLARK COUNTY AIRPORTS

On-Site Economic Activity of the Airport	$1 billion
Increased Economic Activity for Local Business	$3.05 billion
Benefits to Residents from Transportation Cost Savings	$231 million
Economic Benefits from Visitor Activity	$3 billion
Total Primary Economic Activity Attributable to LAS, North Las Vegas and Henderson Executive Airports	**$7.28 billion**

Source: Evenson & Schwer, UNLV, Clark County Airport System Impact Study: 2004-2005 (2005).

Given the significant role of tourism in the metropolitan economy, and the fact that more than 47 percent of all tourists to the Las Vegas metropolitan area arrive through McCarran Airport, the ability of CCDOA to provide long-term commercial air service capacity is critical to the continued economic health of the metropolitan area.

2.3 ACCOMMODATE AIRPORT USERS WITH THE BEST POSSIBLE FACILITIES AND SERVICE

It is CCDOA's policy to maintain a high level of service for passengers at LAS. Level of service (LOS) is a measure of how well passenger demand is served and is defined as the quality or conditions of service that passengers experience at a facility. LOS is normally expressed in terms of either (1) passenger inconvenience (*e.g.,* waiting times or missed flights); or (2) the space, size or number of facilities available for processing passengers (*e.g.,* the terminal building in square feet per passenger, the ticket counter length in linear feet per passenger, baggage claim area and belt length, FIS facilities, holdrooms and concessions). Selection of the desired LOS is a matter of policy and judgment and depends on several factors, including the characteristics of the airport and the customers it serves (*e.g.,* business versus recreational travelers or connecting versus origin and destination passengers).[12] The Las Vegas metropolitan area has certain unique characteristics that drive CCDOA's policy determinations:

- Las Vegas is primarily a resort destination to and from which much of the travel is discretionary. If the level of service to visitors is degraded through excessive aircraft delays, visitors may choose an alternate resort destination, thereby adversely affecting the regional economy.[13]

[11] LVCVA (2006).

[12] Ricondo & Associates, Final Supplemental Environmental Assessment for the Construction of Terminal 3 (2005); CCDOA, Forecast of the Distribution of Aircraft Operations Between McCarran International Airport (LAS) and the Proposed Ivanpah Valley Airport (IVP) (2006).

[13] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).

- Air carriers are faced with very low financial yields in the Las Vegas market and are therefore sensitive to the incremental system costs which result from departure and arrival delays.

- LAS is not a hubbing airport and has a very high level of origin and destination (O&D) traffic, which puts increased pressure on roadways, curbsides, ticketing, security, passenger processing and baggage handling facilities, as well as the concourses and passenger holdrooms and gate areas.

With these characteristics in mind, CCDOA has identified three objectives that are critical for achieving an acceptable level of service: (1) minimize average annual delay per operation; (2) maintain historical levels of service in landside facilities; and (3) provide efficient access to the metropolitan area for commercial service passengers.

2.3.1 Minimize Average Annual Delay Per Operation

Four to six minutes of average annual delay per aircraft operation is generally considered to be an acceptable level of delay for commercial service airports.[14] CCDOA has therefore previously concluded that an annualized average delay of no more than six minutes will ensure an adequate level of passenger service and will support LAS's role as gateway to the resort destination of Las Vegas.[15]

In 2006, CCDOA conducted Total Airport and Airspace Model (TAAM) simulation experiments, based on the Unconstrained Forecast, in order to refine its understanding of future levels of delay at LAS.[16] Through these experiments, CCDOA has calculated that LAS will experience annual average delays of 6 minutes per operation by 2009. *See* **Figure 2-1**. LAS could, of course, operate with higher levels of delay per operation but the result would be a diminished level of service. Toward that end, CCDOA has concluded that some delay beyond six minutes may be necessary, and therefore an acceptable tradeoff, in order to ensure sufficient commercial air service capacity to the metropolitan area in the near-term.

In the long-term, however, increased delays at LAS would result in such degraded service that it would adversely affect passenger choice. This is based on the fact that Las Vegas is primarily a resort destination to and from which much of the travel is voluntary. Excessive delay would also negatively affect air carriers who are faced with very low yields in the Las Vegas market.

Ultimately, once LAS reached an average annual delay of 20 minutes per operation (approximately the highest recorded average delay per operation known to FAA at an airport in

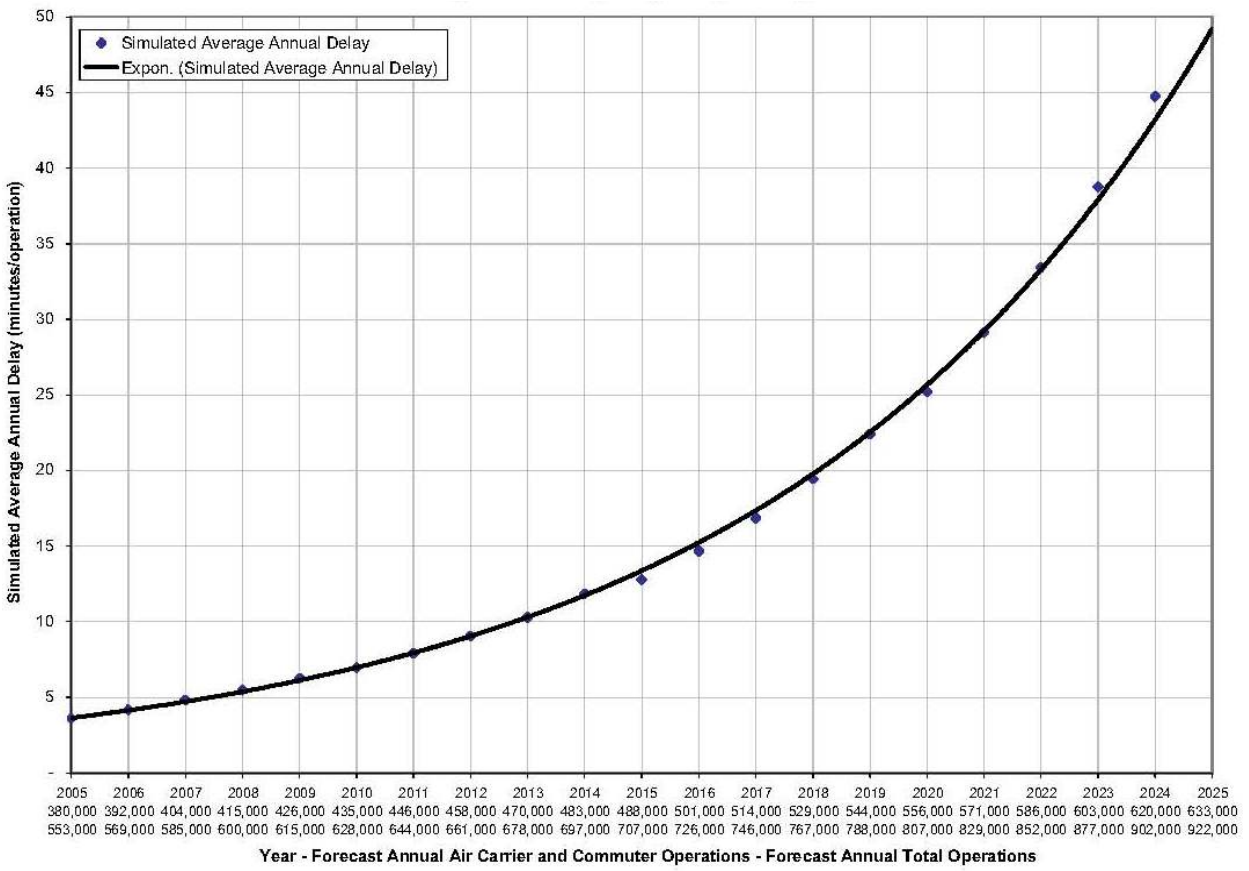
[14] FAA AC 150.5070-6B (2005) at § 805(a); *see also* FAA, Report to Congress: National Plan of Integrated Airport Systems (NPIAS) 2005-2009 (2004).

[15] Preston Aviation Solutions, Computer Simulation of LAS Airport; LAS Annual Capacity Study (2004); Ricondo & Associates, Runway Capacity and Airfield Delay Analysis (2000).

[16] Ricondo & Associates, Development of Unconstrained Total Airport and Airspace Model (TAAM) Simulation Timetables, TAAM Simulation Results, and Annualization of TAAM Simulation Results (2006).

the U.S.[17]), any attempt to consider passenger LOS would no longer be relevant. FAA has determined that 20 minutes of average annual delay per operation is the practical capacity of an airport and the point at which growth in operations at the airport would largely cease.[18] As depicted in **Figure 2-1**, LAS is expected to reach 20 minutes of average annual delay per operation by 2018/2019.

FIGURE 2-1
SIMULATED AVERAGE ANNUAL DELAY AT LAS WEIGHTED BY RUNWAY USE PERCENT



Source: CCDOA calculations (2006)

2.3.2 Maintain Historical Levels of Service in Landside Facilities

Given the competitive nature of modern commercial air service, it is important to enhance the traveler's experience and make his or her trip as uneventful and enjoyable as possible. This is particularly critical for Las Vegas, which is primarily a resort destination to and from which much of the travel is optional. CCDOA has identified specific terminal design standards to ensure acceptable levels of service for passengers to the Las Vegas market. Specifically, CCDOA has determined that terminal facilities must provide at least 10 square feet per enplaned

[17] FAA, Airport Benefit-Cost Analysis Guidance (1999).
[18] *See e.g.,* FAA, Airport Benefit-Cost Analysis Guidance (1999).

or deplaned passenger for ticketing and baggage claim areas respectively. In addition, CCDOA has determined that holdrooms must provide between 2,000 to 2,500 square feet (*i.e.*, 19 to 20 square feet per enplaned passenger). As passenger throughput increases, there is a direct impact on the entire terminal, including, but not limited to, the following facilities:

- Airport roadway network and terminal curbsides;
- Parking and rental car facilities;
- Shuttle busses;
- Passenger ticketing and baggage check-in;
- Security lines;
- Automated transit systems;
- Hold-rooms;
- Restrooms;
- Concessions and gaming areas;
- Baggage claim; and
- Taxi lines.

In terms of measuring overall terminal complex performance, CCDOA has determined that the target activity level at LAS (*i.e.*, the level of demand that the airport can accommodate while ensuring an acceptable level of passenger service) is an annual throughput of no more than 450,000 annual passengers per constructed gate (225,000 annual enplanements). The number of passengers per gate provides a reasonable estimate of the overall strain on the facilities. CCDOA, therefore, uses passenger throughput as a simplified proxy for determining acceptable passenger convenience and comfort. CCDOA has determined that when throughput at LAS exceeds 450,000 passengers per gate per year, the strain on the entire airport facility creates an unacceptable LOS.

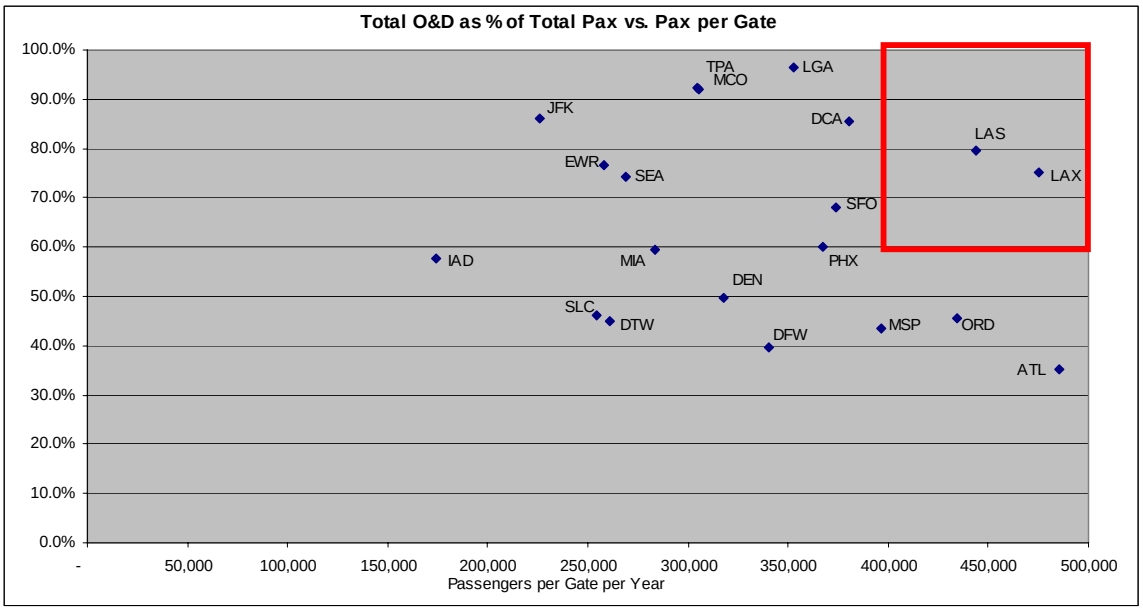
In 2004, for example, (because of the loss of six gates due to repair, maintenance and rehabilitation projects) gate utilization exceeded 480,000 passengers per gate and the level of service in terms of holdrooms and other areas was well below CCDOA's desired level of service. The high gate utilization led to crowded holdroom areas, and also to delays at passenger processing facilities such as ticketing, security and baggage claim because of the excessive number of passengers using terminal facilities.[19]

A comparison of passenger throughput at other airports serving high levels of O&D traffic (depicted in **Figure 2-2**) confirms that throughput of 450,000 annual passengers per gate is an extremely aggressive level given the proportion of O&D traffic that LAS experiences.[20]

[19] Ricondo & Associates, Final Supplemental Environmental Assessment for the Construction of Terminal 3 at McCarran International Airport (2005).

[20] CCDOA, Forecast of the Distribution of Aircraft Operations Between McCarran International Airport (LAS) and the proposed Ivanpah Valley Airport (IVP) (2006 Draft).

FIGURE 2-2
TOTAL O&D AS PERCENTAGE OF TOTAL PASSENGER THROUGHPUT



Source: CCDOA calculations, 2006.

While the terminal facilities at LAS are not constrained from accommodating additional traffic, and could serve a higher level of demand, CCDOA has determined that doing so would not be feasible or practical *for this market* because it would reduce the passenger experience and result in increased congestion to the point that visitors would choose an alternate resort destination, with a concomitant serious negative effect on the economy of the metropolitan area.[21]

2.3.3 Provide Convenient Access to the Las Vegas Economic Center

The third of CCDOA's goals related to LOS is to ensure easy access between Las Vegas and existing and planned airport facilities.[22] It is critical, therefore, that any new facility(ies) constructed for the purpose of supporting the Las Vegas tourist industry be located within a reasonable driving distance and travel time to central Las Vegas.[23]

CCDOA has determined that the most desirable sites for any new facilities will therefore need to be located within approximately 30 miles of the economic center of Las Vegas. Any site with a driving time of more than 45 minutes is not acceptable.[24] By way of comparison, all but one of

[21] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
[22] HNTB, Southern Nevada Regional Airport System Plan (2006 Draft).
[23] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
[24] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).

the 30 busiest airports in the world are within 30 miles of the relevant nearby economic center (*see* **Table 2-2**).

TABLE 2-2
APPROXIMATE DISTANCE FROM ECONOMIC CENTER TO THE 15 BUSIEST WORLD AIRPORTS (2005)

Rank	City (Airport)	Total Passengers	Miles from City Center
1	Hartsfield - Jackson Atlanta International Airport	85,907,423	10
2	Chicago O'Hare International Airport	76,510,003	19
3	London Heathrow Airport	67,915,389	15
4	Tokyo Haneda Airport	63,282,219	30*
5	Los Angeles International Airport	61,485,269	19
6	Dallas - Ft. Worth International Airport	59,064,360	19
7	Paris Charles de Gaulle International Airport	53,756,200	14
8	Frankfurt International Airport	52,219,412	8
9	Las Vegas McCarran International Airport	44,280,190	7
10	Amsterdam Airport Schiphol	44,163,098	9
11	Denver International Airport	43,307,335	25
12	Madrid Barajas International Airport	41,939,904	8
13	Phoenix Sky Harbor International Airport	41,204,071	5
14	Beijing Capital International Airport	40,989,651	18
15	John F Kennedy International Airport	40,584,001	21
16	Hong Kong International Airport	40,282,000	21
17	Houston George Bush Intercontinental Airport	39,713,920	21
18	Bangkok International Airport	38,985,043	15
19	Minneapolis/St. Paul International Airport	37,563,664	10
20	Detroit Metropolitan Wayne County Airport	36,374,906	21
21	Orlando International Airport	33,907,396	13
22	San Francisco International Airport	33,580,662	13
23	Newark Liberty International Airport	33,033,569	5
24	London Gatwick Airport	32,784,177	28
25	Singapore Changi Airport	32,430,856	13
26	Tokyo Narita Airport**	31,525,275	40
27	Philadelphia International Airport	31,502,855	8
28	Miami International Airport	31,008,453	8
29	Toronto Pearson International Airport	29,914,925	17
30	Seattle-Tacoma International Airport	29,289,009	15

* Distance obtained from http://www.japan-guide.com/e/e2430.html.
**Narita Airport is on a high-speed train line, which reduces travel time to the city center.
Source: Passenger Statistics: Airports Council International, 2006; Approximate Driving Distance – Domestic: Google Earth, International: World Travel Guide, 2006.

CCDOA recognizes that efficient and timely transfer of visitors between any commercial service airport and the resort destinations of Las Vegas is vital to maintaining the economy of the region. Ground access was the basis for the assumption in the site evaluation study that any new airport

had to lie within 45 minutes travel time of the central resort area of Las Vegas. The evaluation of travel time was based upon existing surface transportation infrastructure. CCDOA anticipates that access to and from the new airport will utilize existing vehicular and rail surface access corridors as much as possible.[25] In later phases of planning, CCDOA will conduct more refined simulations to determine the projected travel time from the proposed airport to central Las Vegas in light of surface transportation improvements that are reasonably foreseeable between today and the proposed opening date for the new airport.

2.4 PLAN FUTURE AVIATION DEVELOPMENT THAT IS CONSISTENT WITH LOCAL AND REGIONAL LAND USE PLANNING AND ENHANCES COMPATIBILITY OF EXISTING FACILITIES

Las Vegas has experienced dramatic growth over the past two decades, resulting in a high concentration of residential and commercial development immediately surrounding LAS and its runway approaches. While CCDOA has managed conflicts between the increased development and current operations at LAS, current development raises significant doubts about whether expansion of the existing airport system is either feasible or practical in a manner that is compatible with the surrounding land uses.

CCDOA works closely with the Clark County Department of Comprehensive Planning (Department)[26] to ensure that any development of the regional airport system is consistent and compatible with the Clark County Comprehensive Plan and local land use plans.[27] In its dealings with the Department, it is CCDOA's objective to eliminate, through the planning process, any existing and future issues of incompatible residential and community development. This enables the Department to meet other regionally important goals related to prudent planning for transportation, conservation areas and land use.

Therefore, when planning any expansion of the regional airport system, CCDOA must take into account the degree to which any potential expansion would be compatible with local land use plans. Failure to do so would both undermine and also unravel decades of planning efforts by CCDOA and the Department, and the resulting network of land use plans designed to mitigate impacts to airport environs. CCDOA has concluded, therefore, that any proposal to provide supplemental aviation capacity for Las Vegas should consider compatibility with the following three land use measures.

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[25] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).

[26] The Department is the entity responsible for current and long-range planning within Clark County; it is responsible for developing and administering planning policies and programs that manage the impacts of Clark County's rapid population and economic expansion and the resulting development.

[27] The key land use plans impacting the Las Vegas metropolitan area are the Winchester/Paradise Land Use Plan (2005), the Enterprise Land Use Plan (2004), and the Spring Valley Land Use Plan (2004).

2.4.1 LAS Noise Compatibility Program

CCDOA and the Department have developed a comprehensive program to review and address the noise impacts of LAS and other airports within the Clark County Airport System. The principal planning documents used to guide these noise efforts are a Noise Exposure Map (NEM) and a Noise Compatibility Program (NCP).[28]

CCDOA conducted its most recent noise study in 1994 and currently is preparing an update to the NEMs and NCP that is expected to be completed by the fourth quarter of 2006. The NCP measures that the County has pursued or likely will pursue through the pending update include the following: a preferential runway use program; preferred departure and arrival flight procedures; encouraging use of quiet aircraft; promoting use of the County's reliever airports for general aviation; bi-annual noise monitoring; maintaining a public information program; recommending that local governments discourage new incompatible land uses; supporting redevelopment from incompatible to compatible uses; encouraging or requiring disclosure of airport noise impacts in real estate transactions; and acquiring or sound insulating incompatible structures. Several of these measures are intended specifically to ameliorate noise impacts in areas exposed to noise between DNL 60 and 65 dB, in recognition that noise exposure in those areas is moderate.

CCDOA's current efforts promote land use compatibility between LAS and surrounding community and also serve to reduce noise in areas deemed compatible but that nevertheless are exposed to moderate levels of airport-related noise. The NCP measures that have been adopted and pursued by CCDOA are designed to address current and forecast airport operations while attempting to respect the settled expectations of the airport's neighbors. CCDOA promotes use of runways and flight profiles that avoid populated areas and strongly encourages local governments with land use jurisdiction to promote land use compatibility as well. This is an extremely difficult balance, particularly in light of intense development pressures in the Las Vegas metropolitan area.

2.4.2 Cooperative Management Agreement

Any proposed capacity-enhancing project must also take into account compatibility with the 1992 Cooperative Management Agreement (CMA) between Clark County and the Bureau of Land Management (BLM).[29] The CMA was executed in 1992 to provide for cooperation between BLM and the County in land use planning and management to protect against the

[28] The NEM is a map of the airport and surrounding area depicting cumulative noise exposure. The NCP is a plan containing noise abatement and mitigation measures to be accomplished by the airport proprietor and local governments. Neither the NEM nor NCP are required by federal law; however, airports are eligible to receive federal grants to conduct noise studies and to implement noise abatement and mitigation measures adopted as part of a NCP. The FAA considers virtually all land uses experiencing aircraft noise below DNL 65 dB to be compatible with airport operations and thus does not fund measures to address noise below that level.

[29] Interim Cooperative Management Agreement between The United States Department of the Interior Bureau of Land Management and Clark County (1992).

encroachment of incompatible land uses on federal land under the airspace used for aircraft departing to the west and southwest of LAS. It also ensured that the BLM would not transfer any public lands to private ownership without the concurrence of Clark County. The area governed by the CMA encompasses approximately 20,543 acres located to the west and south of LAS, the boundaries of which were defined by aircraft departure flight corridors and the 60 decibel (dB) day-night average sound level (DNL) noise contour for LAS at the time.[30] Since 1992, the County has managed this land to ensure compatibility with airport operations according to the terms of the CMA.

2.4.3 South County Interstate 15 Corridor Plan

Any project proposed to be located in the South County must be compatible with the South County Land Use Plan. The Department most recently updated this plan in December 2005, with the South County Interstate 15 Corridor Plan (I-15 Plan), in response to CCDOA's Proposed Action. This plan documents the land use goals and policies implemented by the County in order to provide practical solutions to facilitate the development of the Ivanpah Airport and to mitigate impacts that result from the construction and operation of the airport. In particular, the I-15 Plan emphasizes that it is the County's policy to encourage the maximization of public infrastructure and facilitate a better airport operational level of service, while at the same time maintaining and enhancing the scenic beauty of the I-15 Corridor. Toward that end, the I-15 Plan identifies specific policies, including:

- Aesthetics and visual impacts caused by any type of proposed or expanded development should be controlled.

- Any proposed development within the I-15 Corridor should be properly screened and buffered in accordance to Title 30 Clark County Unified Development Code, Section 30.64, Site Landscape and Screening Standards. Waivers to these standards should not be granted to any project within the I-15 Corridor.

- Any development within the Ivanpah Airport Noise Compatibility Area, [31] which is in conflict with the uses planned for the airport, should be discouraged.

- Residential uses are incompatible with the airport and should be excluded from the Ivanpah Airport Noise Compatibility Area.

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[30] Under the Southern Nevada Public Land Management Act of 1998 (SNPLMA), approximately 5,226 acres of federal land holdings and interests within the CMA were transferred to Clark County in March 1999. Clark County is responsible for the management and disposal of all CMA lands. Only those land uses deemed compatible with operations at LAS are permitted on the CMA parcels acquired by Clark County under the terms of the SNPLMA. Clark County, Department of Comprehensive Planning, *Winchester/Paradise Land Use Plan* (2005). Compatible use is defined as residential uses no greater than 2 dwelling units per acre or any industrial or commercial use. Clark County, Department of Comprehensive Planning, *Comprehensive Plan Elements* (2006) available at: http://www.co.clark.nv.us/comprehensive_planning/CompPlanElements/CD_Element/CDElement_Index.htm.

[31] The Ivanpah Airport Noise Compatibility Area is the approximately 17,000 acres that BLM must transfer to CCDOA, upon the County's request, once the EIS for the Ivanpah Project is complete. *See* Clark County Conservation of Public Land and Natural Resources Act of 2002, Pub. L. 107-282 § 501 (2002).

- Commercial General and Commercial Tourist uses should be located only in Sloan, Jean and Primm. Where applicable, all uses shall be subject to all requirements and height restrictions as may be recommended by the Department of Aviation.

- All land uses (excluding the Ivanpah Airport and airport ancillary uses) and especially single family residential, which negatively affect air quality or consume air credits are not appropriate in the I-15 Corridor, and should be strongly discouraged.

- Preserve and protect Bureau of Land Management lands known as the Large Scale Translocation Study Area (also known as the Desert Tortoise Translocation Area) from development.

In furtherance of these goals, the I-15 Plan designates the majority of land in the South County as open space, with only limited development allowed in Goodsprings, Jean and Primm. *See* **Figure 2-3**.

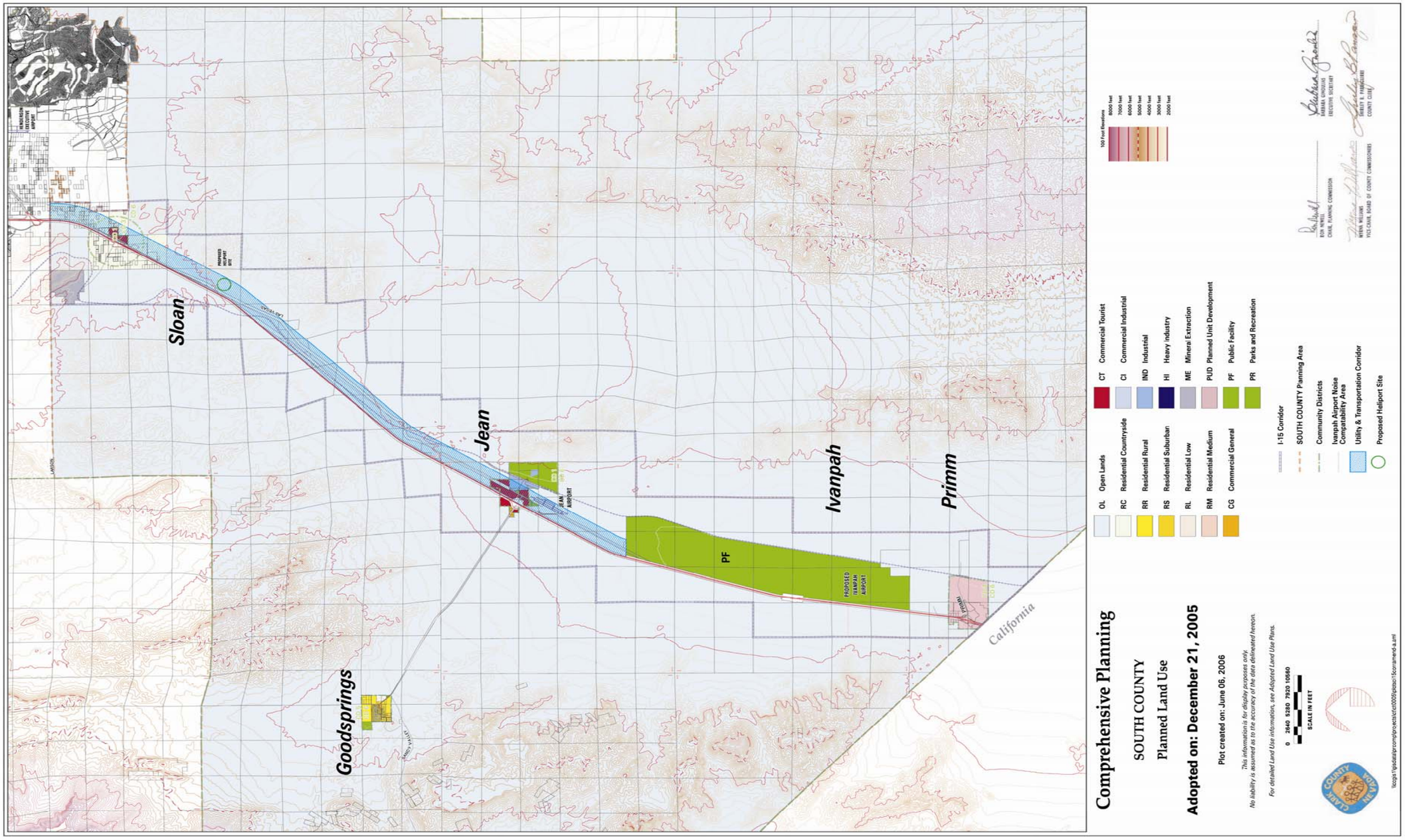
2.5 PLAN FUTURE AVIATION DEVELOPMENT THAT IS CONSISTENT WITH THE REGIONAL AIRPORT PLAN AND ENHANCES EFFICIENCY OF THE ENTIRE AIRPORT SYSTEM

CCDOA's chief mission is to provide aviation facilities to support the Las Vegas economy -- especially the tourism industry -- while accommodating the needs of other aviation users in the Las Vegas metropolitan area with the best possible facilities.[32] In response to the dramatic increase in aviation demand, CCDOA has planned and developed the regional airport system to best meet the existing and projected needs. Toward that end, CCDOA has created a Southern Nevada Regional Airport System Plan (the Airport System Plan), the goal of which is to accommodate all the various aviation needs of Southern Nevada. The Airport System Plan provides the framework by which the regional airport system can be developed, considering the following constraints: (1) land availability; (2) airspace complexity; (3) surrounding natural conditions (particularly terrain); (4) environmental considerations; and (5) financial considerations.[33]

Within that framework, the Airport System Plan optimizes use of individual airports (both existing and planned), as well as the airspace, navigational, and other aviation facilities that are shared by aircraft operating at one or all of the airports in Southern Nevada. The Airport System Plan identifies appropriate roles for individual aviation facilities within the system and has recognized that LAS is the primary commercial service airport serving the Las Vegas metropolitan area. While other regional airports such as Henderson Executive and North Las Vegas accommodate some limited commercial service, the Airport System Plan concluded that the appropriate role for those airports is to be first-class reliever airports and to serve primarily

[32] HNTB, Southern Nevada Regional Airport System Plan (2006).
[33] HNTB, Southern Nevada Regional Airport System Plan (2006).

FIGURE 2-3
SOUTH COUNTY PLANNED LAND USE



Source: Department of Comprehensive Planning, South County Land Use and Development Guide (2004).

the needs of general aviation users.[34] The Airport System Plan also identifies the need for new sites for potential long-term development of commercial service, and recognizes CCDOA's proposal to develop a supplemental commercial service airport in the Ivanpah Valley.

2.5.1 LAS's Role as the Primary Commercial Service Airport

LAS is located about 5 miles south of the City of Las Vegas near the southern end of the Las Vegas Strip. The airport occupies about 3,000 acres and includes a runway system and terminal complex planned and designed for large and heavy air carrier aircraft.

LAS is the primary commercial service airport serving the metropolitan area; it serves as the means of access for more than 47 percent of all visitors to the area. It also currently serves air cargo demand and operations of corporate and general aviation aircraft, as well as operations of fixed wing aircraft and helicopters providing air tours of the Grand Canyon and other points of interest such as the Las Vegas Strip and Hoover Dam.[35] LAS is classified as a large hub and is ranked 5th among U.S. airports in terms of total domestic enplanements.

In response to the dramatic increase in demand for commercial service to the Las Vegas metropolitan area over the past decade, CCDOA has taken every available measure to develop the LAS facilities (including both the runway and taxiway complex and landside facilities) to the fullest extent practical, considering the available land and surrounding land use patterns. **Tables 2-3 and 2-4** and **Figure 2-4** identify the recent and pending improvements at LAS, the purpose of each improvement and the date (or projected date) of completion.

TABLE 2-3
CCDOA-SPONSORED IMPROVEMENT PROJECTS AT LAS

	Date of Completion	Project	Purpose
1	1985	Terminal 1 - New ticketing and baggage claim buildings	Alleviate terminal congestion
2	1987	Concourse C - New construction (addition of 16 gates)	Expand terminal capacity
3	1990	Runway 7R-25L - New construction	Expand airside capacity; accommodate projected demand for 1992
4	1991	Terminal 2 (Charter/International Terminal) - Rehabilitation project	Alleviate terminal congestion
5	1994	Airport Connector Tunnel/Southern Access Roadway	Provide new ground access to LAS; relieve ground access congestion
6	1994	Concourse C - Four gate expansion	Expand terminal capacity
7	1996	Runway 7L-25R - Extension	Expand airside capacity; provide sufficient runway length to facilitate more departures during hot summer months; provide capability for direct, nonstop, transoceanic service

[34] HNTB, Southern Nevada Regional Airport System Plan (2006); Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).

[35] HNTB, Southern Nevada Regional Airport System Plan (2006).

	Date of Completion	Project	Purpose
8	1997	Runway 1L-19R - Upgrade (widening and lengthening; construction of associated taxiways, lighting, marking, drainage and safety areas)	Expand airside capacity; accommodate forecasted demand through 2012
9	1997	Runway 7R-25L Extension	Provide flexibility for closing Runway 7L-25R for maintenance and added safety margin for heavy air carrier aircraft arrivals
10	1998	Terminal 1 - Ticketing building expansion	Alleviate terminal congestion
11	1998	Terminal 1 - Baggage Claim expansion	Alleviate terminal congestion
12	1998	Concourse D - Construction (addition of 26 gates)	Expand terminal capacity
13*	1998	Installation of common use terminal equipment	Alleviate terminal congestion
14	2004	Taxiway Z - New construction Taxiway C - Extension to east of air cargo apron	Expand airfield capacity
15	2005	Concourse D - Northeast Extension (net addition of 10 gates)	Expand terminal capacity
16	2006 – Projected	Consolidated Rental Car Facility - New construction	Expand RON parking capacity; expand on-site long-term parking facilities
17	2007 – Projected	High speed exit taxiway off 25L	Expand airfield capacity
18	2008 – Projected	Concourse D - Northwest Expansion (total of 8 gates)	Expand terminal capacity
19	2011 – Projected	Terminal 3 - New construction (14 new gates and landside support for Concourse D)	Expand terminal capacity and alleviate terminal congestion

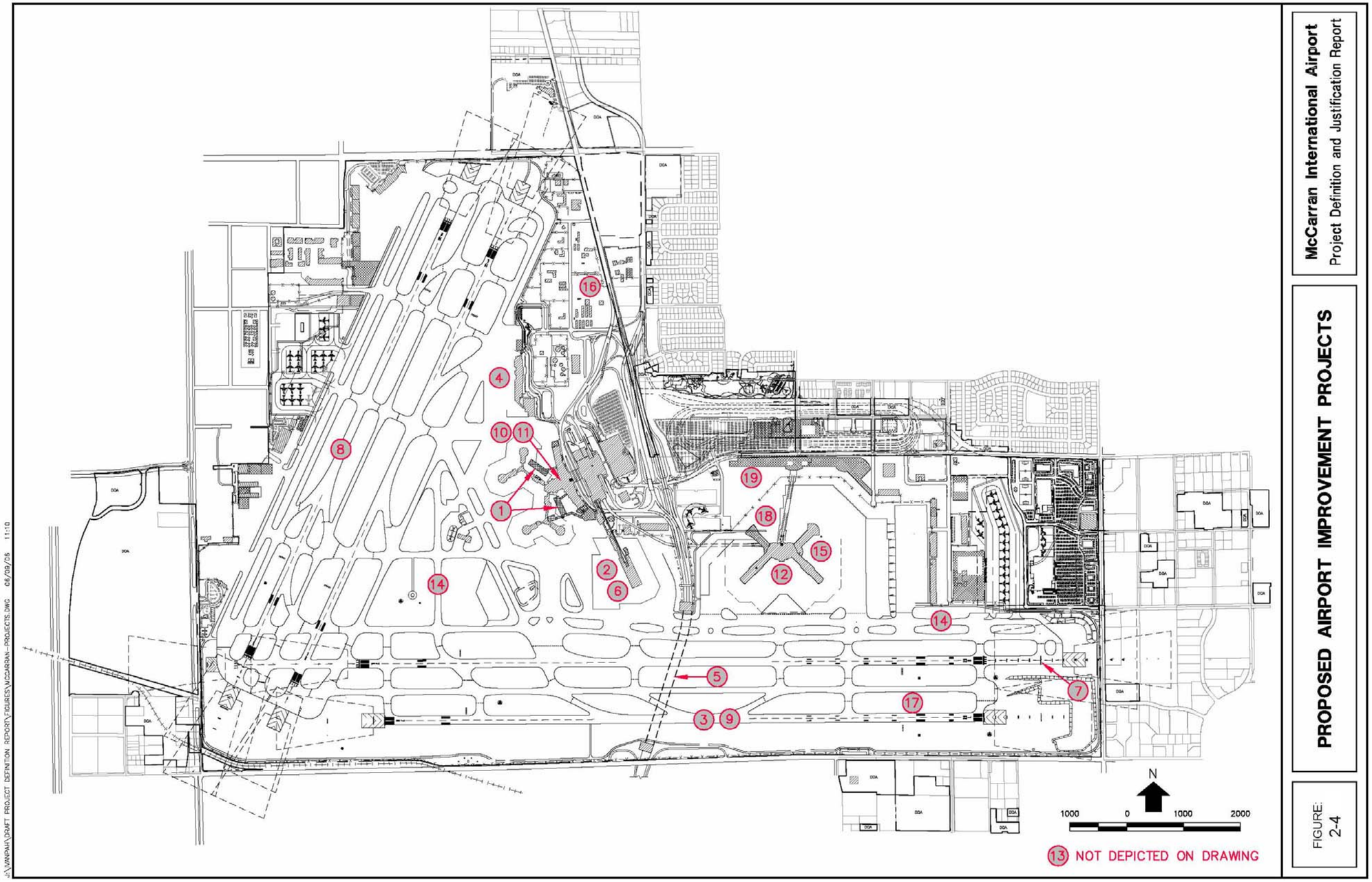
Source: CCDOA, 2006.

TABLE 2-4
FAA-SPONSORED IMPROVEMENT PROJECTS AT LAS

Date of Completion	Project	Purpose
2004	Installation of instrument landing system (ILS) on Runway 1L	Expand airfield capacity
2006 – Projected	Four Corner Post Plan Supplemental EA	Expand airspace capacity
Under review	Simultaneous Operations on Intersecting Runways	Expand airfield capacity
Under review	RNP/RNAV arrivals on 1L and 1R.	Expand airfield capacity

Source: CCDOA, 2006.

CCDOA has also developed and continues to enhance reliever airport facilities to alleviate congestion at LAS, allowing the airport to better serve in its role as the primary air passenger airport serving the region.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McCarran International Airport
Project Definition and Justification Report
PROPOSED AIRPORT IMPROVEMENT PROJECTS
FIGURE: 2-4
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2.5.2 The Role of Other CCDOA-Operated Airports in the Regional System

North Las Vegas Airport. North Las Vegas Airport is located about 8 miles northwest of LAS and accommodates corporate and general aviation operations as well as some Grand Canyon air tour operators. The airport occupies about 813 acres of land and has three runways: Runway 7-25 (5,005 feet long), Runway 12R-30L (5,000 feet long), and Runway 12L-30R (4,000 feet long). Neither Runway 7-25 nor Runway 12R-30L is equipped with an instrument landing system (ILS). A Category 1 ILS for Runway 12L has been completed and is operational.[36] Clark County obtained title to North Las Vegas Airport in 1987 and has planned and developed the airport to be a general aviation reliever to LAS.[37]

Henderson Executive Airport. Henderson Executive Airport is located within the City of Henderson, Nevada, about 6 miles south of LAS, and adjacent to existing and planned residential development within the City of Henderson. The airport occupies about 827 acres of land and has two parallel runways: Runway 17L-35R (5,000 feet long) and Runway 17R-35L (6,500 feet long). Both runways are equipped with medium intensity runway lights (MIRL) on both ends. Clark County acquired Henderson Executive Airport from a private owner in 1996 and has planned and developed the airport to serve as another first class reliever to LAS. Consistent with the airport's role, CCDOA has made improvements at the airport, including terminal and tower facilities, realignment and construction of the two runways, and addition of non-precision instrument approach procedures.[38]

Jean Airport. Jean Airport is located within unincorporated Clark County about 20 miles south of LAS. The airport occupies 230 acres of land and has two general use parallel runways: Runway 2L-20R (4,600 feet long) and Runway 2R-20L (3,700 feet long). Runway 2L-20R is equipped with MIRL. Jean Airport serves primarily as a sport aviation airport and CCDOA has developed the facilities and procedures at the airport to support such activity.[39]

Overton Municipal Airport-Perkins Field. Overton Municipal Airport-Perkins Field is a general aviation airport located in northeastern Clark County about 70 miles northeast of Las Vegas, and two miles north of the City of Overton. The airport occupies about 250 acres of land and has one runway, Runway 13-31 (4,800 feet long). The runway is equipped with MIRL. The primary role of Perkins Field is to serve aircraft operators in the Overton area. The role of the airport is not anticipated to change and operations at the airport are expected to grow only in relation to growth of the Overton community.[40]

[36] HNTB, Southern Nevada Regional Airport System Plan (2006).
[37] HNTB, Southern Nevada Regional Airport System Plan (2006).
[38] HNTB, Southern Nevada Regional Airport System Plan (2006).
[39] HNTB, Southern Nevada Regional Airport System Plan (2006).
[40] HNTB, Southern Nevada Regional Airport System Plan (2006).

2.5.3 The Role of Regional Airports Not Operated by CCDOA

Several other airports or aviation facilities are located within or near the Las Vegas metropolitan area. Some of these facilities are simple private landing strips. There are four non-CCDOA airports that play a meaningful role in the regional airport system.

Boulder City Municipal Airport. Boulder City Municipal Airport is owned and operated by the City of Boulder City, Nevada. The airport is located in southeastern Clark County about 25 miles southeast of LAS, and accommodates general aviation, sport aviation facilities, and Grand Canyon air tours.[41]

Laughlin/Bullhead International Airport. Laughlin/Bullhead International Airport is primarily a commercial service airport serving the communities of Bullhead City, Arizona and Laughlin, Nevada. It is located east of the Colorado River, along the Nevada/Arizona border, immediately south of the Lake Mead National Recreation Area, and is owned by Mohave County, Arizona and operated through the Mohave County Airport Authority.[42]

Mesquite Municipal Airport. Mesquite Municipal Airport is owned and operated by the City of Mesquite, Nevada, and primarily serves general aviation aircraft operators in the Mesquite area. It also serves itinerant general aviation aircraft operators visiting the Mesquite area. The airport is located in northeastern Clark County near the Nevada-Utah border. The airport is located atop a mesa north of the City center and was initially constructed in the early 1990s. Since the construction of the airport, residential and recreational developments have surrounded the airport on three sides. Little expansion capability is available at the existing airport site because of the terrain and development in the airport environs. The City of Mesquite has proposed the development of a new airport that will be located about 15 miles west of Mesquite and is engaged in the federal environmental review process for that new airport.[43]

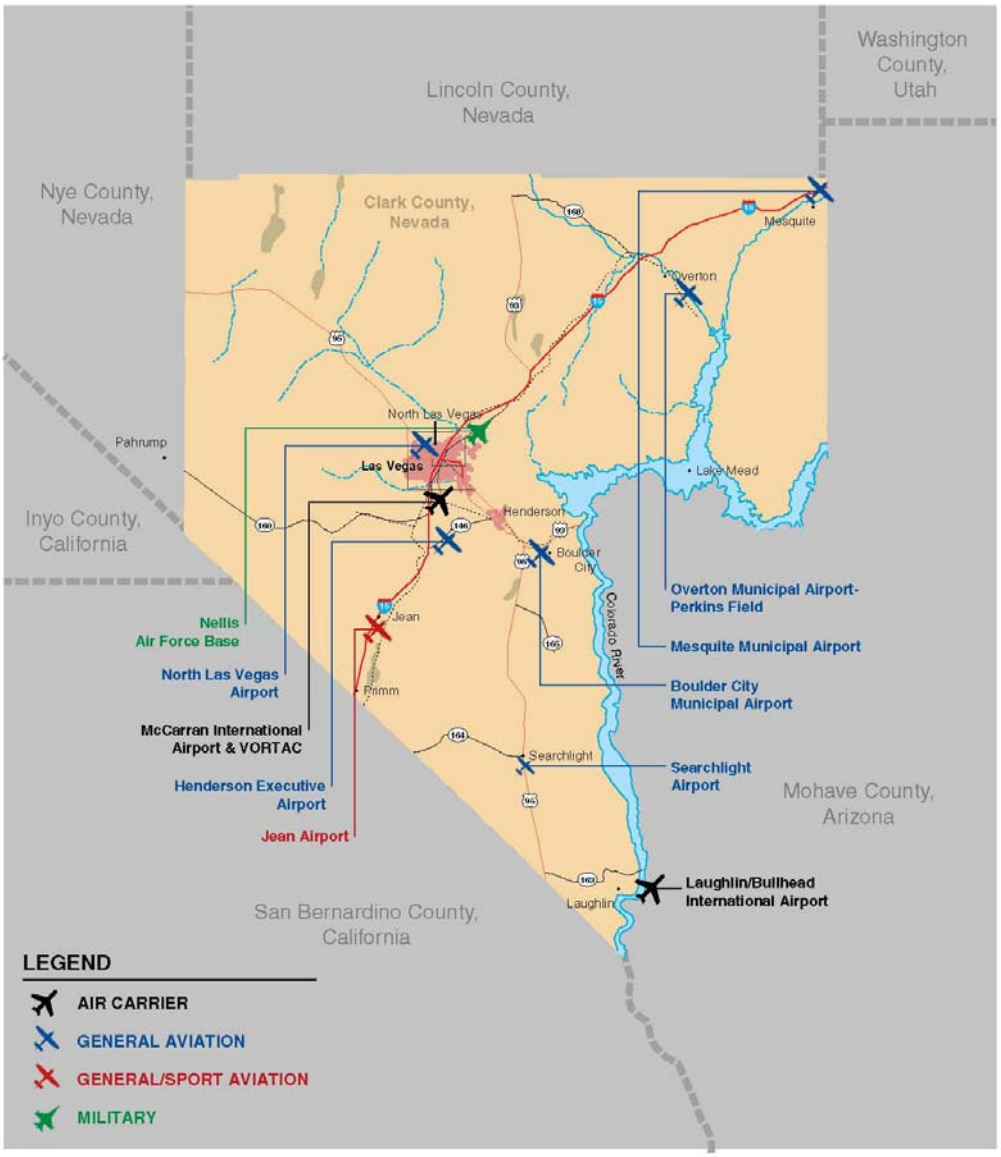
Nellis Air Force Base. Nellis Air Force Base is located about 10 miles northeast of LAS and is owned and operated by the United States Air Force (USAF). The Base is the home to several USAF wings and accommodates all operations of these wings, as well as training and other services to other branches of the U.S. Department of Defense and air defense divisions of U.S. allies.[44] It is not available for civilian commercial use.

Searchlight Airport. Searchlight Airport is located approximately 70 miles southwest of Las Vegas in southern Clark County. The airport occupies 240 acres of land and has one runway, Runway 16-34 (5,040 feet long). CCDOA used to lease this land from BLM and operated Searchlight Airport primarily to serve general aviation aircraft operators in the area of the airport. The estimated number of operations at the airport was about one-half dozen per month.[45] CCDOA has not renewed this lease, however. BLM is currently considering an application by Searchlight Airport Developers, LLC to operate the facility. BLM has informed CCDOA,

41 HNTB, Southern Nevada Regional Airport System Plan (2006).
42 HNTB, Southern Nevada Regional Airport System Plan (2006).
43 Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
44 Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
45 HNTB, Southern Nevada Regional Airport System Plan (2006).

however, that in the event that BLM does not lease the land to Searchlight Airport Developers, CCDOA will be responsible for appropriate closure measures.[46]

FIGURE 2-5
REGIONAL AIRPORT AND AVIATION FACILITIES



Source: Ricondo & Associates, Southern Nevada Regional Airport System Plan Update, 2001.

2.5.4 Long-term Airport Development

The Airport System Plan also recognizes that a critical step in airport system planning is the identification of long-term airport development alternatives. It analyzes alternatives for long-

[46] Letter from Juan Palma, BLM Field Manager, Las Vegas Field Office, to Randall Walker, Director of Aviation, CCDOA (May 4, 2006).

term development based on key airport system goals, including: (1) ability to accommodate projected demand; (2) land availability; (3) generalized airspace complexity; (4) land use compatibility; and (5) consistency with overall Plan objectives.

With these goals in mind, the Airport System Plan recognizes that in order to accommodate future passenger demand in the region, and in order to maintain desired levels of service without excessive aircraft and passenger delay, supplemental air carrier airport facilities will necessary. The Airport System Plan concludes that CCDOA's proposal to develop a new commercial service airport in the Ivanpah Valley, meets several of the Plan goals, "especially accommodating long-term aviation demand and enhancing land use compatibility."[47]

2.6 MAXIMIZE THE UTILITY OF AIRSPACE AND ENHANCE AIR TRAFFIC SAFETY AND EFFICIENCY

CCDOA needs to ensure that any plan for providing additional commercial service aviation capacity to the metropolitan area does not, in any manner, compromise appropriate safety levels for future commercial service users. For example, airspace near the metropolitan area is constrained by non-regulatory factors including tall structures such as the buildings along the Las Vegas Strip. While none of the existing buildings present any hazards to current operations at LAS, they do, nevertheless, limit CCDOA's ability to expand the airfield at LAS. CCDOA's options for providing supplemental commercial air service capacity are also limited by the high terrain throughout the South County.

A third and critical factor is the fact that the Las Vegas metropolitan area is located in an area surrounded by special use Airspace, including Military Operating Areas (MOA), Restricted Areas (RA), and Military Training Routes (MTR). While commercial service aircraft are not typically allowed to pass through an RA at any time, they are allowed to pass through an MOA with prior permission. Nevertheless, any such interaction could present significant safety concerns. The restricted airspace around the metropolitan area is actively used for military training operations from Nellis Air Force base and other military facilities. Activities at these facilities include high-speed maneuvering and bombing practice which could be hazardous to any nearby civilian aircraft.

Any solution to the need for supplemental commercial air service capacity to the metropolitan area, therefore, must ensure appropriate distance from the special use airspace, existing buildings, and high terrain in order to ensure an appropriate level of safety.

2.7 MINIMIZE THE ENVIRONMENTAL EFFECTS OF DELAY AT LAS

LAS currently operates with an average annual delay of between 3 and 4 minutes per operation. Based on the rate of growth predicted by recent forecasts, this average annual delay will only increase. As discussed in further detail in **Section 3.4.3** of this document, CCDOA's recent TAAM analysis predicts that LAS will experience an average annual delay of 20 minutes per

[47] HNTB, Southern Nevada Regional Airport System Plan (2006).

operation once demand at LAS reaches approximately 532,000 annual commercial service (air carrier and commuter) flight operations, which is projected to occur in 2018 or 2019, based on the Unconstrained Forecast.[48]

This level of delay will not just affect access to the runways but will reverberate throughout the system, adversely affecting approaches, landings, taxi-ins, taxi-outs, takeoffs and departures from LAS. In addition, there will be cumulative delays that develop on the taxiways and in airspace for aircraft that are in the queue to the runways. These delays will cause related increases in aircraft-related emissions that could have significant adverse environmental impacts. It is CCDOA's goal to minimize such impacts to the extent practical.

[48] Ricondo & Associates, Constrained Forecast of Aircraft Operations, McCarran International Airport (2006).

3 PROJECT JUSTIFICATION

3.1 ECONOMIC GROWTH IN THE LAS VEGAS METROPOLITAN AREA

The Las Vegas metropolitan area has experienced rapid growth over the last decade. As the visitor-oriented economy has grown, this area has led Nevada in population and economic growth. In fact, Las Vegas has been one of the fastest growing metropolitan areas in the United States since 1986. This economic growth is attributable, in large part, to the rapid expansion of the visitor-oriented gaming, convention and tourist industries. These industries are expected to continue to generate most of the future economic growth. Key indicators of the significant economic growth since the 1990's include population, gaming revenues, convention attendance, and hotel/motel room demand.[49]

3.1.1 Population

As shown in **Table 3-1** the population of the Las Vegas metropolitan area nearly doubled from the 1995 population of 1,036,290 to 1,815,700 in 2005 – an increase of just over 75 percent over the course of the decade.[50] Population growth projections remain strong in the near-term. More than 5,000 newcomers move to the Las Vegas metropolitan area every month. If current growth trends continue, the metropolitan area will have 2,058,000 residents by 2010. The growth rate is projected to slow to approximately 7.0 percent per year in the longer term (2020-2025) as the economy matures and fewer new hotels are added than in years past. **Table 3-1** depicts comparative rates of population growth in the metropolitan area, the State of Nevada, and the United States as a whole.

3.1.2 Gaming

For many years, gaming has been the economic engine of the Las Vegas metropolitan area. From 1995 to 2000, gross annual revenues increased from approximately $5.5 billion to $7.5 billion, or approximately 5.6 percent a year - with the highest percentage increase - almost 12 percent - occurring from 1998 to 1999. While revenues remained steadier in the short term following the events of September 11, 2001, revenues in recent years have grown significantly ($8.7 billion in 2004 and $9.7 billion in 2005). **Figure 3-1** depicts gross gaming revenues by year from 1995 to 2005.

[49] Ricondo & Associates, Southern Nevada Regional Airport System Plan (2001) & HNTB, Southern Nevada Regional Airport System Plan (2006).

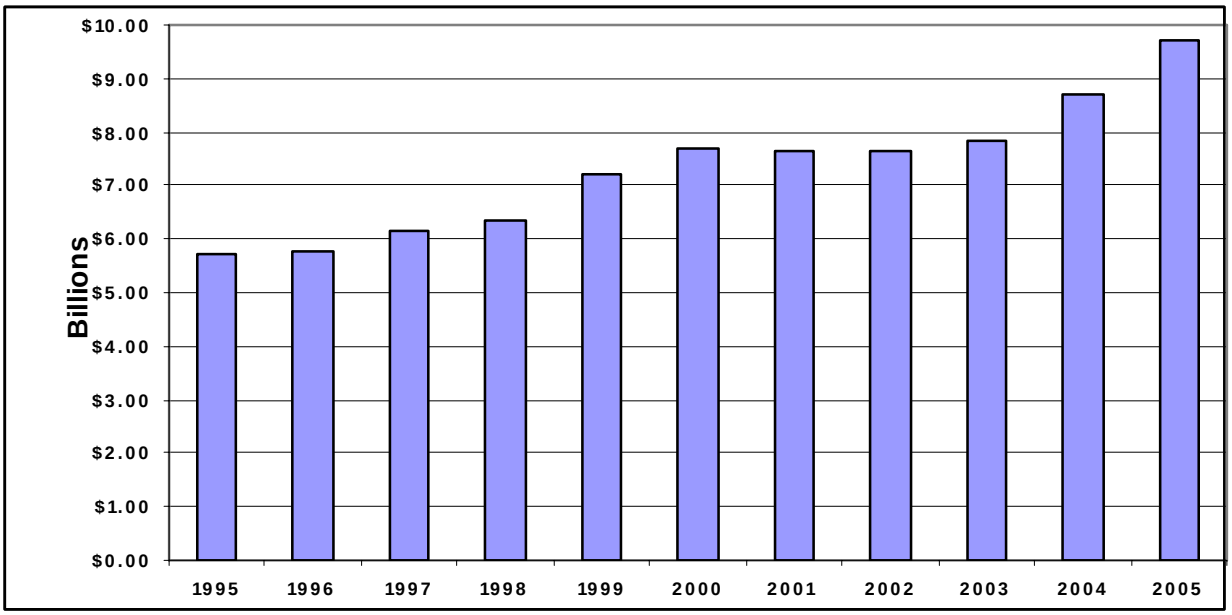
[50] LVCVA (2006).

TABLE 3-1
COMPARATIVE HISTORICAL AND PROJECTED POPULATION GROWTH, LAS VEGAS METROPOLITAN AREA, NEVADA, AND THE UNITED STATES: 1995-2025

	Las Vegas Metro Area		State of Nevada		United States	
	Population (thousands)	Average Annual % Increase	Population (thousands)	Average Annual % Increase	Population (thousands)	Average Annual % Increase
Historical						
1995	1,036	6.6%	1,612	5.6%	262,803	1.0%
1996	1,116	7.7%	1,696	5.3%	265,229	0.9%
1997	1,192	6.8%	1,790	5.5%	267,784	1.0%
1998	1,255	5.3%	1,871	4.5%	270,248	0.9%
1999	1,344	7.0%	1,946	4.0%	272,691	0.9%
2000	1,426	6.1%	2,023	2.7%	272,691	3.5%
2001	1,498	5.1%	2,132	5.4%	285,108	1.0%
2002	1,578	5.3%	2,206	3.4%	287,985	1.0%
2003	1,642	4.0%	2,297	4.1%	290,850	1.0%
2004	1,747	6.4%	2,411	5.0%	293,657	1.0%
2005	1,816	3.9%	2,519	4.5%	296,410	0.9%
Projected						
2010	2,058	13.3%	2,690	6.8%	299,862	1.2%
2015	2,329	13.1%	3,058	13.7%	312,268	4.1%
2020	2,570	10.4%	3,452	12.9%	324,927	4.1%
2025	2751*	7.0%	3,863	11.9%	337,815	4.0%

***** For the Las Vegas Metro Area, the projected population is for the year 2024.
Source: LVCVA; Nevada State Demographer; U.S. Census Bureau.

FIGURE 3-1
GROSS ANNUAL GAMING REVENUES: 1995 – 2005



Source: LVCVA, 2006.

According to the LVCVA, the legalization and development of a major gaming industry in Atlantic City in 1977 and the expansion of legalized gambling, in the forms of casino gambling in several states, state lotteries, riverboat casinos, gaming on Indian Reservations, and other legal forms of betting, have not had a major effect on gaming activity in the Las Vegas metropolitan area. In fact, the recent openings of new types of resorts in Las Vegas have helped to maintain and strengthen the local gaming industry. In 2005, the metropolitan area attracted a record 38,566,717 visitors.[51] Although gaming is expected to continue to be the primary attraction for visitors to the Las Vegas metropolitan area, the number and variety of other tourist-oriented activities are expected to increase as well.[52]

3.1.3 Conventions

According to LVCVA, the total convention attendance in the metropolitan area increased from about 2,925,000 delegates attending 2,826 conventions in 1990 to about 6,166,000 delegates attending 22,154 conventions in 2005, for an average increase of 324,119 delegates per year in the number of delegates and an average increase of 1,933 conventions per year.[53] **Figure 3-2** depicts convention and activity in the metropolitan area and the number of delegates by year from 1995 to 2005.

For the last decade, Las Vegas has consistently been the top city in the nation for tradeshow events. In 2005, Las Vegas hosted a record 44 major tradeshows, as compared to only 26 tradeshows in the second-ranked city, Orlando. Las Vegas' dominance in this field is based on its extensive exhibit and convention facilities.[54] The Las Vegas Convention Center (LVCC) has more than two million square feet of exhibit space and currently accommodates more than 100,000 delegates at one time. The Sands Expo and Convention Center and the Mandalay Bay Convention Center both have more than 1 million square feet of exhibit and event space. The Cashman Field complex offers 100,000 square feet of exhibit space. In addition, the LVCVA has just begun work on a $737 million expansion of the LVCC, which will include a new 100,000 square foot general session space. The purpose of the LVCC expansion project is to ensure that the Las Vegas metropolitan area remains the number one tradeshow destination in an increasingly competitive environment.[55] Casinos and hotels in Las Vegas also have over 2 million square feet of exhibit space combined, bringing the countywide total to over

[51] LVCVA (2006).

[52] Ricondo & Associates, Southern Nevada Regional Airport System Plan (2001) & HNTB, Southern Nevada Regional Airport System Plan (2006); Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).

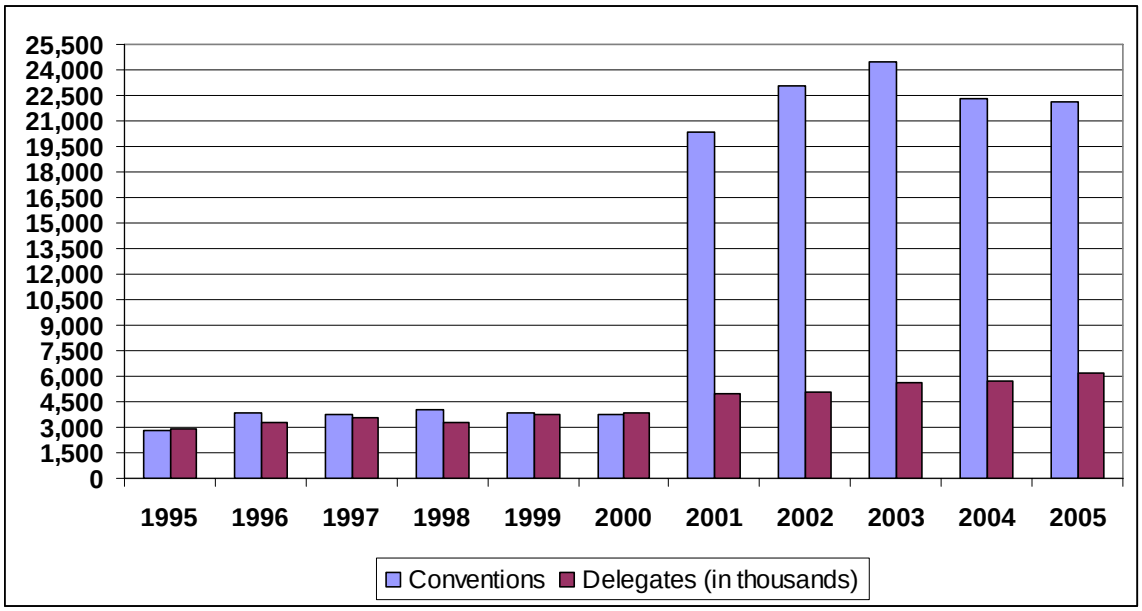
[53] LVCVA (2006).

[54] Chris Jones, Las Vegas Review Journal, *Trade Shows Big and Growing* (April 26, 2006).

[55] LVCVA Press Release, "LVCVA Unveils Enhancement Program for Las Vegas Convention Center" (February 16, 2006).

5.9 million square feet of exhibit space. According to LVCVA, strong growth in convention activity is expected to continue in the future.[56]

FIGURE 3-2
LAS VEGAS METROPOLITAN AREA CONVENTION ACTIVITY: 1995-2005



Source: LVCVA, 2006.
Note: Since 2001, convention counts are based on an updated methodology that reflects significant growth in the small meetings market in Las Vegas. All unrevised convention data published prior to 2001 are based on an alternate methodology.

3.1.4 Entertainment, Recreation and Lodging

The metropolitan area continues to experience significant growth in hotel and casino development: 3,695 rooms were added in 2003; another 1,021 rooms were added in 2004; and 3,319 more rooms were added in 2005, bringing the total to 133,186 hotel rooms. In addition, recreation has been an integral part of several major new resort developments in the Las Vegas area. Recently completed and currently planned major projects can be classified as "resort complexes" because they provide a combination of hotel, casino, and other entertainment and recreation facilities.

As depicted in **Table 3-2**, The LVCVA reports that an additional 2,231 rooms will be completed in 2006, including an additional 414 rooms at the already-opened Red Rock Resort Spa & Casino, 695 rooms at the already-opened South Coast Hotel & Casino, and 576 rooms at the Signature at MGM Grand.[57] LVCVA's Construction Bulletin details continued growth, with 6,180 additional rooms scheduled to be completed in 2007; 14,626 additional rooms scheduled to

[56] Ricondo & Associates, Southern Nevada Regional Airport System Plan (2001) & HNTB, Southern Nevada Regional Airport System Plan (2006); Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
[57] LVCVA (2006).

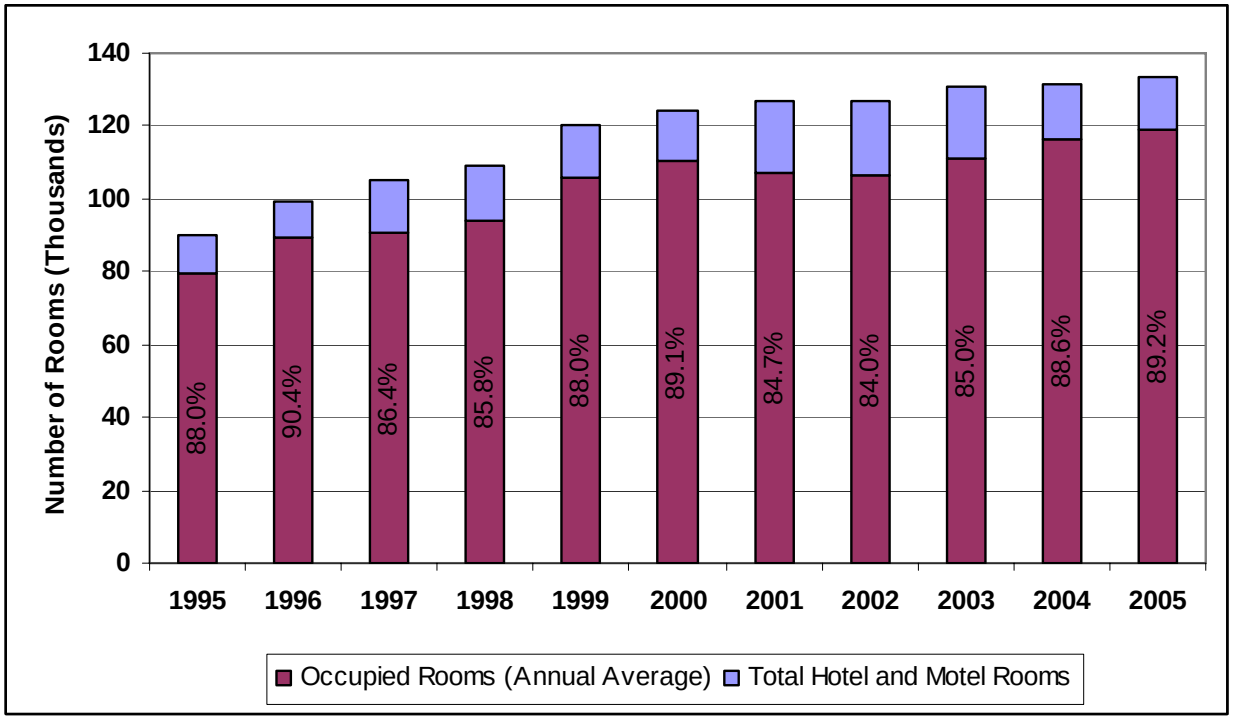
be completed in 2008; 7,600 additional rooms scheduled to be completed in 2009; and 7,300 more rooms scheduled to be completed in 2010.[58]

TABLE 3-2
HOTEL/CASINO DEVELOPMENT - CONSTRUCTION BULLETIN

Las Vegas Metropolitan Area	Additional Time Share Units	Additional Hotel/Motel Rooms	Total Hotel/ Motel Rooms
Las Vegas Room Inventory (Dec. 31, 2005)			**133,186**
2006 Additions	1,286	2,231	135,417
2007 Additions	--	6,180	141,597
2008 Additions	--	14,626	156,223
2009 Additions	--	7,600	163,823
2010 Additions	--	7,300	171,123
TOTAL	**1,286**	**37,937**	**171,123**

Source: LVCVA, 2006.

FIGURE 3-3
LAS VEGAS INVENTORY OF HOTEL AND MOTEL ROOMS
AND PERCENT OCCUPANCY: 1995-2005



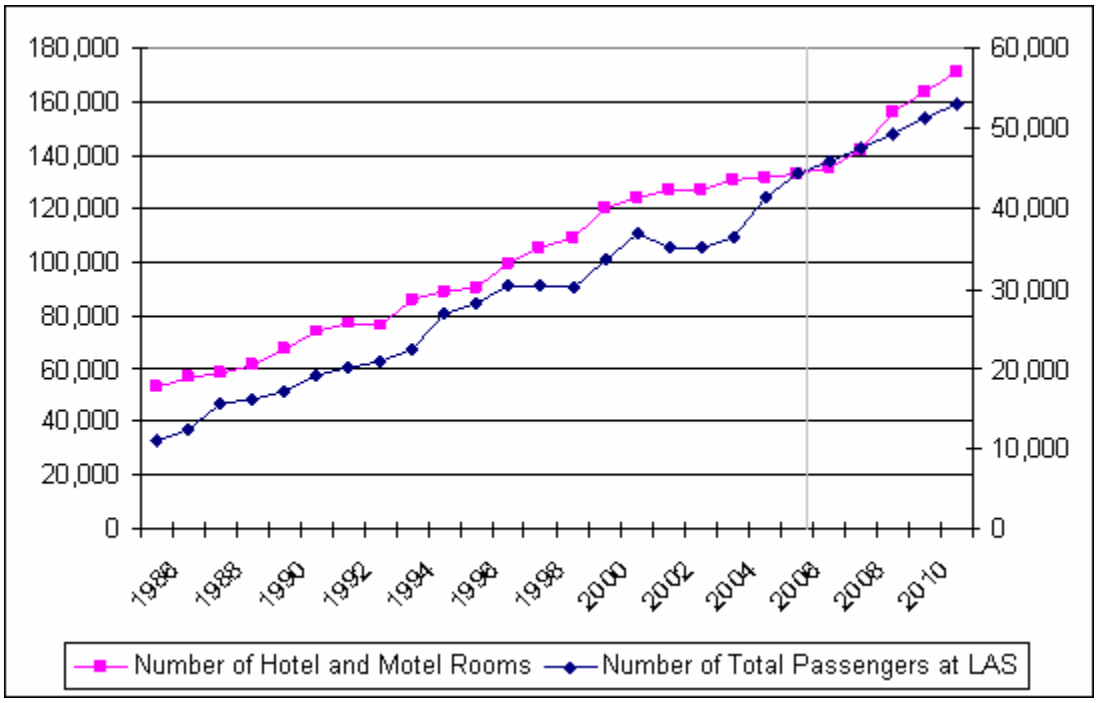
Source: LVCVA, 2006.

A strong correlation has existed and continues to exist between the number of available hotel/motel rooms in the Las Vegas metropolitan area and the total number of passengers at

[58] LVCVA (2006). These figures represent only those projects that have been approved, have secured funding, and have a confirmed opening date. Tentative projects, and proposed projects with undetermined construction dates are not included in these totals.

LAS. As depicted in **Figure 3-4**, the number of available rooms in 1986 was 56,494 and the total number of annual passengers was 12,428,748. By 2005, the number of available rooms was 133,186 and the number of total annual passengers had risen to 44,267,362.[59] Over time, there has been a close and consistent correlation between hotel rooms and LAS passengers. LAS has seen an average growth of 320 new passengers annually per each newly constructed room.[60]

FIGURE 3-4
COMPARISON OF PASSENGER VOLUME AND ROOM AVAILABILITY AT LAS



Source: LVCVA & URS Corporation, 2006.
Note: The grey line separates the historical passenger data from the projected passenger data. To obtain these future passenger values, the historical data for total enplanements and total passengers was used to calculate the ratio of total enplanements to total passengers (enplanements and deplanements). This ratio was calculated for each year from 1995 to 2005, and these ratios were averaged together to obtain the average ratio of total enplanements to total passengers. The projected total enplanement values were divided by the average ratio, which results in a projected total passenger value for each year.

3.2 ASSOCIATED GROWTH IN AVIATION DEMAND FOR THE METROPOLITAN AREA

3.2.1 Historical Demand

The economic boom experienced in Las Vegas in the past decade has been accompanied by equally strong growth in the demand for air travel. The rate of increase of aviation demand in the metropolitan area has been significantly higher than the national average over the past decade. **Table 3-3** presents historical enplanement data for Las Vegas compared with national

[59] LVCVA (2006).
[60] CCDOA (2006).

averages. As shown in this table, passenger activity at metropolitan area airports increased by 4.8 percent and 7.8 percent at McCarran and North Las Vegas airports, respectively; and decreased 3.3 percent at Henderson Executive from 1995 to 2005.[61] This represents an average annual compound growth rate (AACGR) of 4.8 percent over the decade, as compared with approximately 2.3 percent for the nation as a whole over the same period. While this rate moderated some following the events of September 11, 2001, growth has remained vigorous due to the dynamic economy of the area. The historical year over year increases can be attributed primarily to the rapid expansion of the Las Vegas tourist economy, the opening of major new resort complexes, and airlines providing service to LAS at attractive fares.

TABLE 3-3
LAS VEGAS METROPOLITAN AIRPORTS: HISTORICAL ENPLANEMENTS BY AIRPORT

	McCarran International					North Las Vegas	Henderson Executive	Boulder City*
Year	Air Carrier	Charter	Commuter	General Aviation	Total	Total	Total**	Total
1995	11,643,692	1,896,009	113,378	153,053	13,806,132	189,238	Not Avail.	0
1996	13,225,661	1,735,881	98,166	76,482	15,136,190	352,349	107,073	16,031
1997	13,175,832	621,857	96,800	76,272	13,970,761	433,287	129,807	3,916
1998	13,093,257	601,481	27,349	77,235	13,799,322	357,664	111,534	0
1999	14,675,631	433,881	33,331	101,289	15,244,132	253,696	146,605	0
2000	16,295,367	1,824,137	23,834	90,741	18,234,079	343,176	141,992	0
2001	15,754,293	1,562,359	34,933	61,367	17,412,952	276,260	143,343	0
2002	16,047,075	1,108,574	50,966	111,305	17,317,920	278,224	102,591	0
2003	16,933,438	848,787	44,455	112,105	17,938,785	360,728	75,956	0
2004	19,316,046	784,963	327,593	126,582	20,555,184	404,975	87,079	0
2005	20,513,452	550,190	773,563	138,390	21,975,595	402,405	79,125	0
AACGR (1995-2005)	5.8%	-11.6%	21.2%	-1.0%	4.8%	7.8%	-3.3%	n/a
U.S. AACGR (1995-2005)	1.10%	Not Available	10.30%	Not Available	2.30%	2.30%		

* Boulder City data comes from the FAA 2006 Terminal Area Forecast (TAF) data.
** 1995 Data is not available; growth rate is calculated based on 1996-2005 data.
Source: CCDOA & FAA 2006 TAF, February, 2006.

While North Las Vegas and Henderson airports account for some of the historical enplanements at airports in the Las Vegas metropolitan area, clearly LAS, as depicted in **Table 3-3**, has historically accommodated the vast majority of commercial passengers in the metropolitan area.[62]

3.2.2 Forecasted Demand

The annual number of passenger enplanements for the Las Vegas metropolitan area is expected to continue to increase at a rapid rate. These enplanements will occur predominantly at LAS. **Table 3-4** depicts CCDOA's projections for enplanements by airport. The projections for LAS

[61] 1996 enplanements were used for Henderson Executive since 1995 data is unavailable.
[62] Laughlin/Bullhead International Airport, operated by the Mohave County Airport Authority, is the only other regional airport that has regularly scheduled commercial and air charter service.

are based upon the Unconstrained Forecast.[63] The projections for North Las Vegas and Henderson Executive are based on CCDOA records and analysis by HNTB in conjunction with the 2006 update of CCDOA's Regional Airport System Plan. The projections for Boulder City are based solely on HNTB analysis in conjunction with the update of the Regional Airport System Plan.[64]

TABLE 3-4
PROJECTED SCHEDULED ENPLANEMENTS AT LAS VEGAS METROPOLITAN AIRPORTS

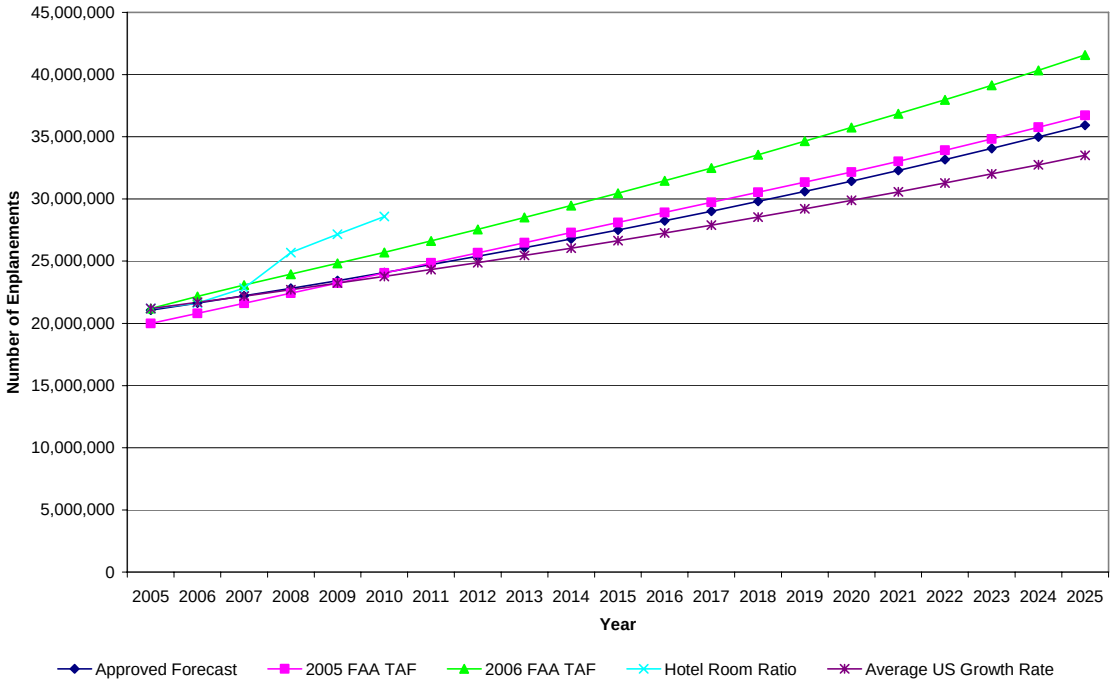
Airport	Projected Number of Air Carrier and Commuter Enplanements				
	Existing (2005)	2010	2015	2020	2025
McCarran International	21,197,746	25,711,710	30,462,387	35,747,252	41,579,453
North Las Vegas	144,580	150,084	155,797	161,728	167,884
Henderson Executive	0	0	0	0	0
Boulder City	0	0	0	0	0

Source: FAA 2006 TAF; HNTB, Southern Nevada Regional Airport System Plan (2006 Draft Update).
Note: There is a discrepancy between 2005 values between **Tables 3-3** and **3-4** because TAF values in **Table 3-4** are still forecast; additionally a slight variation may exist in how FAA and CCDOA define Air Carrier and Commuter operations thus affecting enplanements values.

In determining the need for the Ivanpah Airport, CCDOA has intentionally taken a reasonably conservative approach to projecting future passenger demand in the metropolitan area. The FAA-approved Unconstrained Forecast, upon which CCDOA is relying to examine the impacts of its Proposed Action, assumes a mid-level of average growth rate of 2.7 percent per year. This level of growth is comparable to the predictions in FAA's 2005 Terminal Area Forecast (TAF).[65] As an illustration of CCDOA's conservative approach that seeks to avoid over estimating future demand, for example, the actual 2005 demand at LAS exceeded the projections set forth in the Unconstrained Forecast. While the Unconstrained Forecast predicted 21,066,921 enplanements at LAS in 2005, the actual enplanements for that year were 21,197,746.[66] Apparently taking this additional data into account, FAA's 2006 TAF predicts somewhat more robust growth at LAS than that predicted by the agency's earlier TAF and by the Unconstrained Forecast. In addition, the application of CCDOA's historic metric of approximately 320 annual LAS passengers per new hotel room to the number of planned projects with confirmed opening dates also generates a slightly higher growth projection for LAS than is being used for planning purposes for the Ivanpah Airport.

63 URS, Forecast of Commercial Service Airport Activity in the Las Vegas Metropolitan Area (2005).
64 HNTB, Southern Nevada Regional Airport System Plan (2006).
65 URS, Forecast of Commercial Service Airport Activity in the Las Vegas Metropolitan Area (2005).
66 FAA, 2006 Terminal Area Forecast.

FIGURE 3-5
COMPARISON OF FORECASTS FOR PASSENGER ENPLANEMENTS AT LAS



Source: Clark County Department of Aviation, 2006; FAA, 2006; LVCVA, 2006.
Note: The hotel room ratio only tracks projects that have been approved, have secured funding, and have a confirmed opening date, and therefore is only carried out through 2010.

3.3 EXISTING CONSTRAINTS AT LAS

3.3.1 Airfield

The airfield is currently the critical constraint at LAS. The airport has four active runways. *See* **Figure 3-6**. Runway 7L-25R (east-west) is 14,505 feet long by 150 feet wide and is used primarily for air carrier aircraft departures. Runway 25R is equipped with a Category I ILS. Runway 7R-25L (east-west) is parallel to and 1,000 feet south of Runway 7L-25R (measured centerline to centerline). It is 10,525 feet long by 150 feet wide and is used primarily for air carrier aircraft arrivals. Runway 25L end is equipped with a Category I ILS. Runway 1R-19L (generally north-south) is 9,770 feet long by 150 feet wide and is used primarily for air carrier aircraft departures. Runway 1L-19R (generally north-south) is parallel to and 861.5 feet west of Runway 1R-19L (measured centerline to centerline). It is 9,770 feet long by 150 feet wide and is used primarily for air carrier aircraft arrivals and for operations by corporate and general aviation aircraft based on the west side of the airport. Runway 1L is equipped with a Category I ILS. **Table 3-5** provides a summary of the airfield, navigational aids, and air traffic control facilities for these runways.

FIGURE 3-6
LAS AIRPORT LAYOUT PLAN

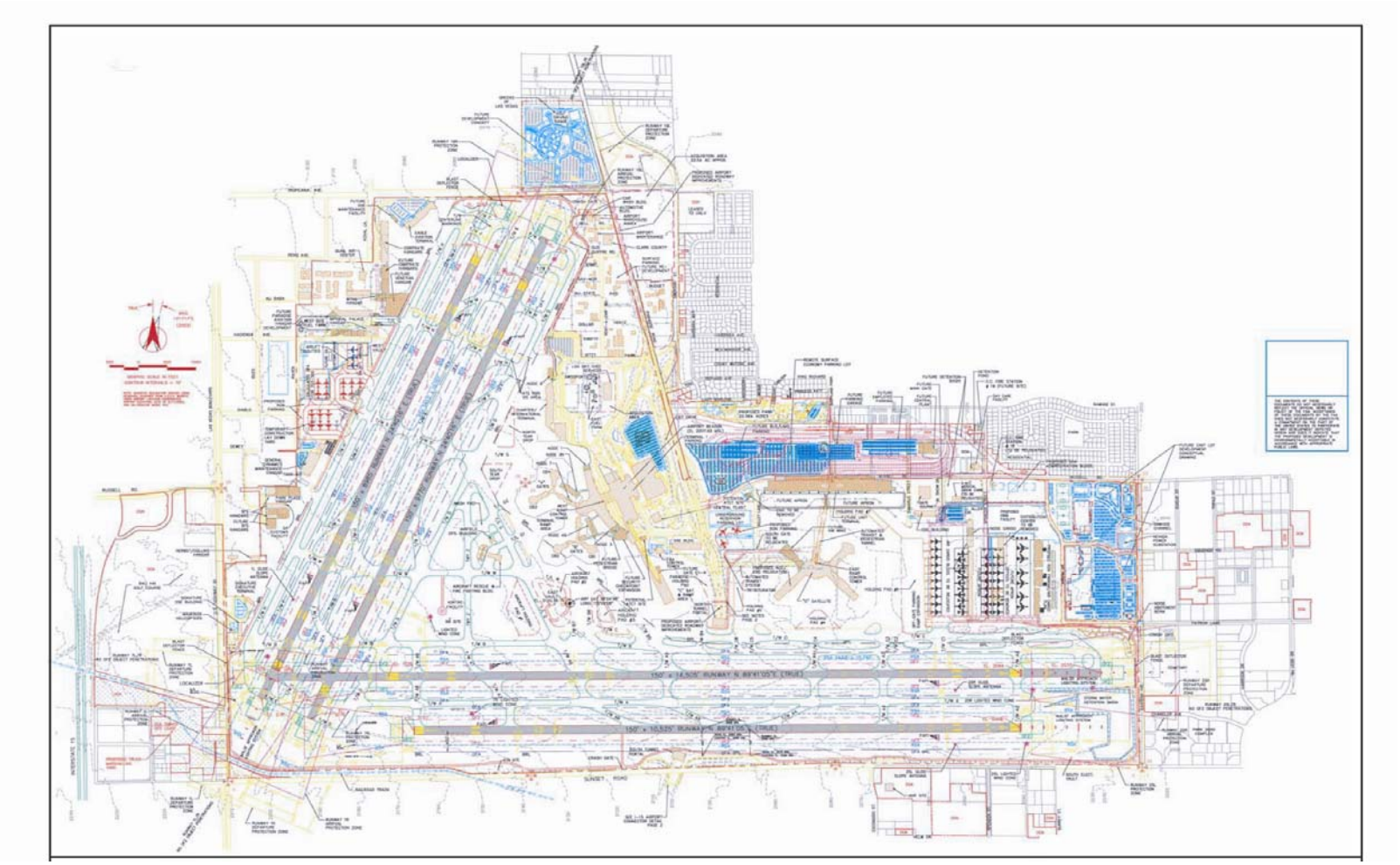


TABLE 3-5
LAS: EXISTING RUNWAY CHARACTERISTICS

	Runway 7L-25R		Runway 7R-25L		Runway 1L-19R		Runway 1R-19L	
	7L	25R	7R	25L	1L	19R	1R	19L
Runway pavement length (ft)	14,505	14,505	10,525	10,525	8,985	8,985	9,770	9,770
Runway pavement width (ft)	150	150	150	150	150	150	150	150
Displaced thresholds (ft)	2,132	1,400	None	None	588	None	491	878
Runway landing length (ft)	11,966	12,755	10,525	10,525	8,401	8,397	9,284	8,897
Effective gradient	-1.04%	1.04%	-1.05%	1.05%	-1.00%	1.00%	-1.00%	1.00%
Approach surface slope	20:1	50:1	20:1	50:1	50:1	34:1	34:1	34:1
Runway threshold elevation (feet above MSL)	2,179	2,033	2,157	2,048	2,181	2,089	2,176	2,078
Wind coverage	96.5%	96.5%	96.5%	96.5%	99.1%	99.1%	99.1%	99.1%
Runway marking	Non-Precision	Precision	Non-Precision	Precision	Non-Precision	Non-Precision	Non-Precision	Non-Precision
Runway lighting	HIRL, PAPI	HIRL, MALSR, PAPI	HIRL, PAPI, REIL	HIRL, MALSF, PAPI	HIRL, MALSF, PAPI, REIL	HIRL, PAPI, REIL	MIRL, PAPI, REIL	MIRL, PAPI, REIL
Instrument runway	Visual	Precision Instrument (200 ft and 1/2 mile)	Visual	Precision Instrument (200 ft and 3/4 mile)	Precision Instrument (300 ft and 1 mile)	Non-precision GPS (800 ft and 1 to 2.5 miles)	Non-precision GPS (600 ft and 1 to 2 miles)	Non-precision GPS (800 ft and 1 to 2.5 miles)

HIRL: High intensity runway lights
ILS: Instrument Landing System
MALSF: Medium intensity approach light system with sequenced flashers on the last three light bars
MALSR: Medium intensity approach light system with runway alignment indicator lights
MIRL: Medium intensity runway lights
MSL: Mean sea level
REIL: Runway end identifier lights
PAPI: Precision approach path indicator

Source: CCDOA, 2006.

CCDOA has already done much to maximize the use of the existing runway and taxiway system at LAS. Wind and weather conditions at LAS permit operations on both sets of parallel runways simultaneously for almost 99 percent of each year. In addition, when these parallel runways are

in use, operations are informally segregated between the pairs of runways such that separations between aircraft arriving and departing on pairs of parallel runways can be minimized; this serves to maximize available airfield capacity. While the airfield geometry at LAS is such that capacity could be increased through land and hold short procedures (LAHSO)[67], FAA no longer allows LAHSO[68] and loss of this procedure has severely limited the capacity of LAS. As a result, it is possible to calculate the practical capacity of the existing airport, based on the existing airfield constraints.

FAA has defined the airfield capacity of an airport to be the point at which it experiences 20 minutes of average delay per operation. Twenty minutes represents the highest level of average delay realized in actual practice, even at highly congested airports. At this level of delay, the FAA predicts that growth in operations will largely cease.[69] As depicted in **Figure 2-1** and described in further detail in **Section 3.4.3** of this report, CCDOA has calculated that LAS will experience 20 minutes of delay per aircraft operation at a demand level of about 532,000 annual commercial (air carrier and commuter) aircraft operations. The Unconstrained Forecast predicts that this level of demand will occur by 2018 or 2019. Beyond that point, the existing airfield at LAS cannot accommodate additional traffic.

3.3.2 Airspace

Operations at LAS are also subject to several airspace constraints. These constraints consist principally of physical items such as tall structures, terrain and regulatory issues such as airspace restricted to military uses. Collectively, these constraints limit the operational flexibility and prevent CCDOA's ability to construct additional on-site runways.

There are a significant number of tall structures and high terrain in the immediate vicinity of LAS that presently affect instrument approach procedures to existing runways and, in certain cases, affect the feasibility of constructing additional runways. *See* **Figures 3-7, 3-8 and 3-9**. For example, high terrain south of the airport limits instrument landing system approaches to a glide slope angle of 3.4 degrees which is higher that the standard glide slope angle of 3 degrees. This higher glide slope angle results in a steeper descent and consequently prohibits aircraft in approach category D. (*i.e.*, aircraft with approach speeds of 141 knots or higher, such as the B-777, DC-10 and B-747) from using this instrument approach.[70]

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67 For example, when Runway 25R is used for arrivals, it would be possible for aircraft to exit the runway or stop and hold short of the intersection of Runways 25R and 19L so that these arrivals are independent of operations on Runway 19. Similarly, when Runway 19L is used for arrivals, it is possible for aircraft to exit the runway or stop and hold short of the intersection of Runways 25R and 19L so that these arrivals are independent of Runway 25R.

68 FAA Order N7100.196 (1999).

69 FAA, FAA Airport Benefit-Cost Analysis Guidance (1999).

70 CCDOA, Forecast of the Distribution of Aircraft Operations Between McCarran International Airport (LAS) and the proposed Ivanpah Valley Airport (IVP) (2006 Draft).

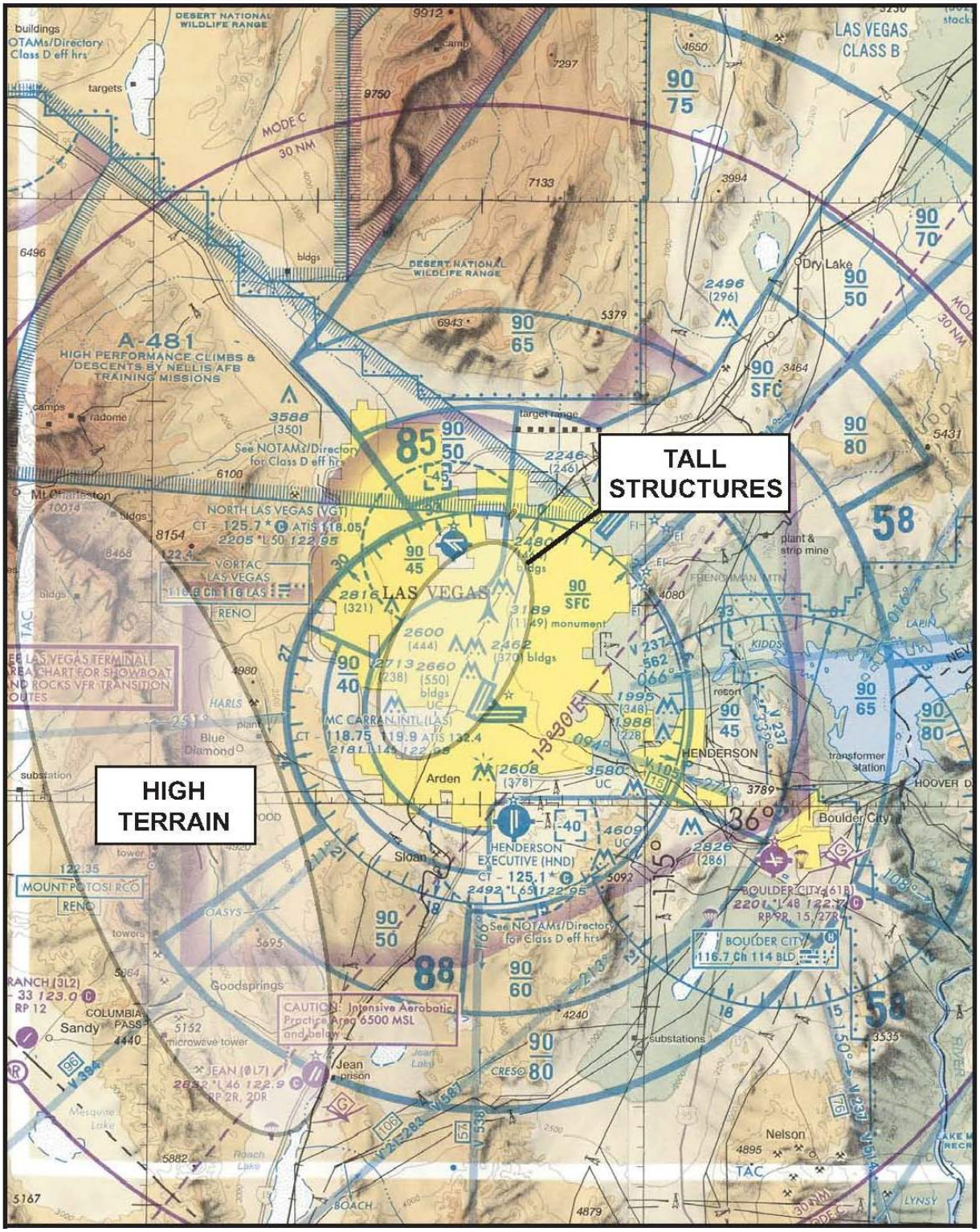
In addition, operations at LAS are also adversely affected by regulatory restrictions affecting the surrounding airspace. LAS is located just 11 miles southwest of Nellis Air Force Base (Nellis), which is surrounded by Restricted and Special Airspace. Bombing practice operations and high performance climbs and descents are performed in this airspace by training missions from military aircraft departing from and returning to Nellis. Civilian use of the airspace controlled by Nellis is severely restricted. Additional military operations areas are also located north and west of LAS. These areas include the Desert Military Operation Area (MOA) north of LAS and the Shoshone, Panamint and Saline MOAs west of LAS. Most of these areas also have unlimited altitudes and some are in effect 24 hours per day. Because of the preponderance of restricted airspace and special use airspace operations areas north and west of LAS, there is only one corridor northwest of the airport that allows for the movement of commercial aircraft to and from the Las Vegas area. This corridor includes high-altitude route J92 and low-altitude route Victor Airway 105-135 and is commonly referred to as the Beatty Corridor. This corridor has a limited capacity for aircraft operations and therefore the options for aircraft departing to or arriving from the northwest are limited by the capacity of the corridor.

In addition to the special use airspace related to military activities, there are additional regulatory issues that affect airspace capacity around LAS. For example, a special flight rules area associated with the Grand Canyon is located approximately 90 miles east of LAS. The applicable flight rules dictate the types of flight activities that may occur below an altitude of 18,000 feet mean sea level.[71]

Consequently, LAS faces significant airspace constraints that limit options for expanding the airport in a manner that would be sufficient to accommodate the projected long-term demand.

[71] CCDOA, Forecast of the Distribution of Aircraft Operations Between McCarran International Airport (LAS) and the proposed Ivanpah Valley Airport (IVP) (2006 Draft).

FIGURE 3-7
LOCAL AIRSPACE AND PHYSICAL CONSTRAINTS



Source: URS (2006).

FIGURE 3-8
REGIONAL AIRSPACE AND REGULATORY CONSTRAINTS

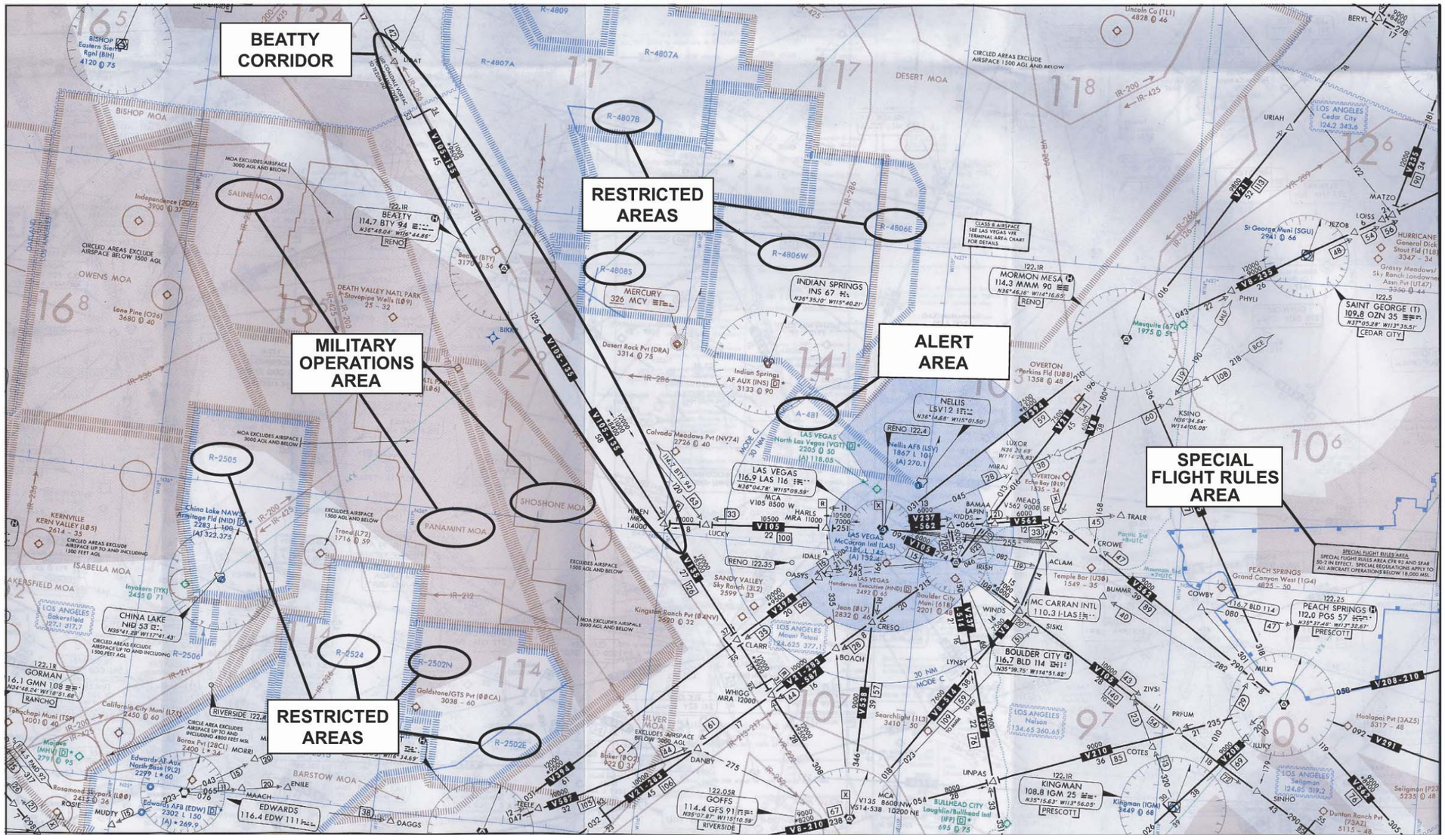
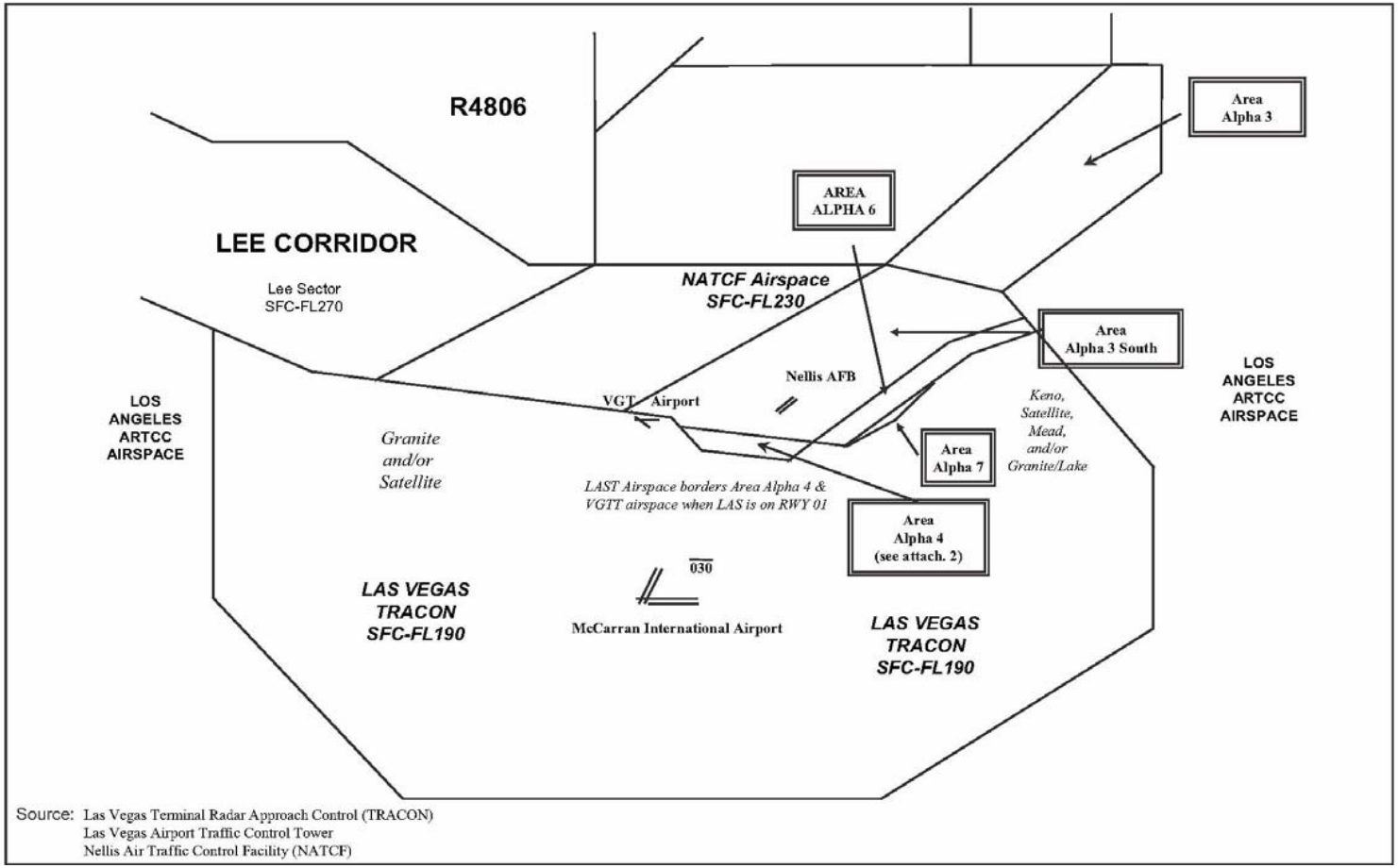


FIGURE 3-9
AIRSPACE DELEGATION



Source: Las Vegas Terminal Radar Approach Control (TRACON)
Las Vegas Airport Traffic Control Tower
Nellis Air Traffic Control Facility (NATCF)

3.3.3 Ground Access and Surface Transportation

The current airport roadway system is also constrained. Primary access to LAS and public parking areas is currently provided via Paradise Road (southbound) from Tropicana Avenue; via the Airport Connector from the Interstate Highway 215 (I-215) Beltway through a tunnel under Runways 7L-25R and 7R-25L (the east-west runways); and via Russell Road from Eastern Avenue. Access to fixed based operator (FBO) and general aviation facilities on the west side of the airport is provided directly from Las Vegas Boulevard (State Route 604/U.S. 91) and via the Hacienda/Koval connector to either Las Vegas Boulevard or Tropicana Avenue.

There is currently a significant level of congestion in the vicinity of the airport. The airport roadway network is unusual in this respect because it serves both airport and local traffic.[72] For example, the intersection of Paradise and Tropicana, which is one of the main access routes for airport traffic, is also burdened by traffic from nearby hotels and the University of Nevada, Las Vegas. (*See* **Figure 3-10**)

During the morning peak period, almost 70 percent of the traffic entering the airport roadway network is commuter traffic. During the evening period, just over 50 percent of the traffic entering the roadway network is commuter traffic.[73] In light of these figures, the peak hour on these roadways is determined more by non-airport commuter traffic rather than by peak aircraft arrivals and departures.[74] Commuter traffic impedes air travelers from accessing LAS for fixed-time departures and diminishes the attractiveness of Las Vegas as a recreational destination.[75]

Currently, roadway segments and intersections in the vicinity of LAS generally operate at LOS D or better (*see* **Table 3-6**). The primary reason is that access to the internal roadway network is constrained by the Paradise Road and Tropicana Avenue intersection, the Paradise Road and Russell Road interchange, and the Airport Connector from I-215. These signalized intersections limit the flow of traffic from the north and east. The Sunset Road off-ramp traffic constrains traffic entering the airport roadway network from the south because of the disruptive effect on mainline traffic caused by weaving traffic prior to the Airport Connector.[76]

Any expansion at LAS would further strain the already burdened local and airport roadway network.

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[72] Parsons, Groundside Access Capacity Study: Phase I: Evaluation of Existing Conditions and Residual Capacities (2003).

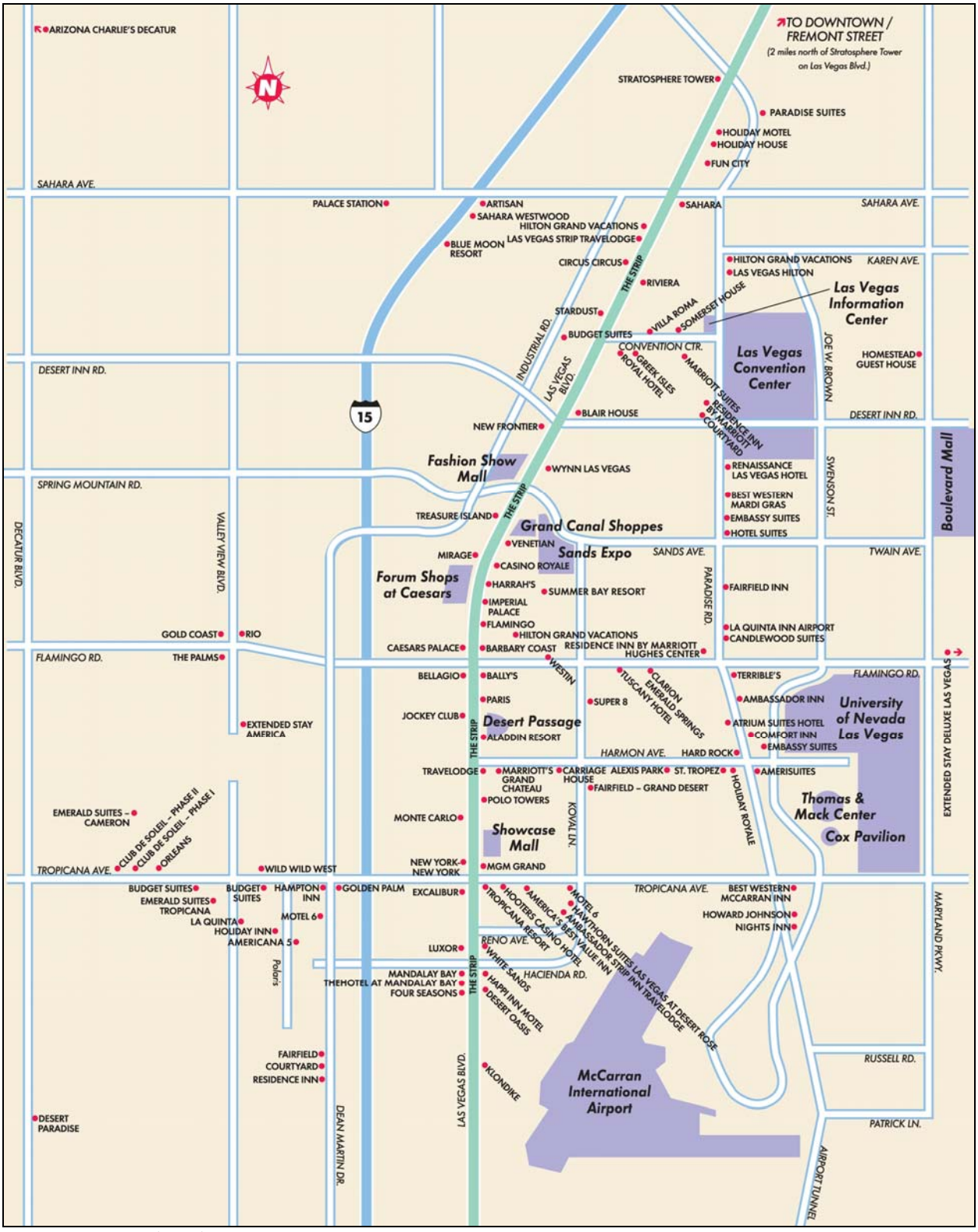
[73] Parsons, Groundside Access Capacity Study: Phase I: Evaluation of Existing Conditions and Residual Capacities (2003).

[74] Louis Berger, McCarran International Airport Traffic Study for the Proposed Terminal 3 (Oct. 2001).

[75] Parsons, Groundside Access Capacity Study: Phase I: Evaluation of Existing Conditions and Residual Capacities (2003).

[76] Parsons, Groundside Access Capacity Study: Phase I: Evaluation of Existing Conditions and Residual Capacities (2003).

FIGURE 3-10
ROADWAYS SURROUNDING MCCARRAN AIRPORT



Source: LVCVA (2006)

TABLE 3-6
CURRENT INTERSECTION LEVEL OF SERVICE

Intersection	Current Level of Service	
	AM Peak Hour	PM Peak Hour
Paradise & Harmon	D	F
Paradise & Tropicana	C	D
Paradise & Kitty Hawk	D	D
Paradise & Russell	C	C
Swenson & Harmon	D	D
Swenson & Tropicana	D	D
Maryland & Tropicana	D	E
Maryland & Hacienda	C	C
Maryland & Russell	C	B
Spencer & Tropicana	D	D
Spencer & Hacienda	A	B
Spencer & Russell	C	C
Eastern & Tropicana	D	E
Eastern & Russell	D	D
Eastern & Sunset	D	F

Source: Louis Berger Group, Inc. (2001)

3.3.4 Terminal Facilities

The existing passenger terminal complex includes two terminal buildings for passenger processing. Terminal 1 includes ticketing, baggage claim and parking facilities for Concourses A, B, C, and D. CCDOA has recently completed a northeast expansion of Concourse D and the northwest expansion is expected to be complete in 2008. The northwest wing project will result in a total of 44 aircraft parking positions on Concourse D. The new gates will be served by expanded aircraft ramp area north of Concourse D, providing dual Airplane Design Group (ADG) IV taxi lanes as well as single ADG V/VI taxi lane capability around the entire east end of the Concourse D facility.[77] Assuming the full build-out of Concourse D, Terminal 1 is designed accommodate 43.2 million annual passengers in an unconstrained manner.

Terminal 2 is a unit terminal separate from Terminal 1 and also includes ticketing, baggage claim, federal inspection services (FIS), and parking facilities. Terminal 2 primarily serves passengers on domestic charter and international flights. Once Terminal 3 is operational, Terminal 2 will remain as a domestic charter facility and will be available for overflow use. This terminal was designed to accommodate 3 million annual passengers with an acceptable level of service.

[77] Ricondo & Associates, Final Supplemental Environmental Assessment for the Construction of Terminal 3 at McCarran International Airport (Sept. 2005).

A new terminal, south of Russell Road, is currently under design and scheduled to open in the first quarter of 2011.[78] Terminal 3 will accommodate new gates, landside passenger processing capability including ticketing, baggage claim, concessions, passenger services, and Federal Inspection Service (FIS) facilities. It will also provide landside support for up to 60 percent of the gates in Concourse D.[79] This expansion of terminal facilities will allow the LAS passenger terminal complex to accommodate the same level of passenger demand that can be served by the airfield, providing an overall balance in the capacities of various components of the airport.[80] Construction of Terminal 3 would increase the overall capacity of LAS to approximately 52 million annual passengers in an unconstrained manner.[81]

The Unconstrained Forecast predicts roughly 83 million annual passengers to Las Vegas in 2025, however.[82] This level of demand far exceeds the currently contemplated terminal capacity at LAS.

3.4 OPTIONS FOR PROVIDING SUPPLEMENTAL COMMERCIAL SERVICE TO LAS VEGAS IN ORDER TO ACCOMMODATE LONG-TERM DEMAND

Based on the historically aggressive growth in the metropolitan area, the projections in the Unconstrained Forecast for long-term aviation demand to Las Vegas, and the existing capacity constraints at LAS, the need for additional commercial air service capacity to the metropolitan area is evident. In response, CCDOA has investigated several options for accommodating the long-term demand for commercial service to Las Vegas, including expansion at LAS, expansion at other regional airports, and a no action alternative. For the reasons outlined below, CCDOA has determined that none of these options is reasonable.

3.4.1 Expansion at LAS

Expansion of the existing facilities at LAS would be, at first glance, a logical answer to resolving the need for additional commercial air service capacity in the metropolitan area. However, because of numerous constraints, it is not feasible to expand LAS to accommodate the projected long-term (2020-2025) growth in commercial service. First, LAS is located in the midst of a heavily urbanized area that abuts the airport on all sides. *See* **Figure 3-11**. This prevents expansion in any direction without extensive land acquisition, relocation of residences and/or businesses, and significant community disruption. Second, expansion of the airfield at LAS is further limited by airspace constraints that limit operational flexibility. Third, while the practical

78 Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005); CCDOA, 2006.

79 Ricondo & Associates, Final Supplemental Environmental Assessment for the Construction of Terminal 3 at McCarran International Airport (Sept. 2005).

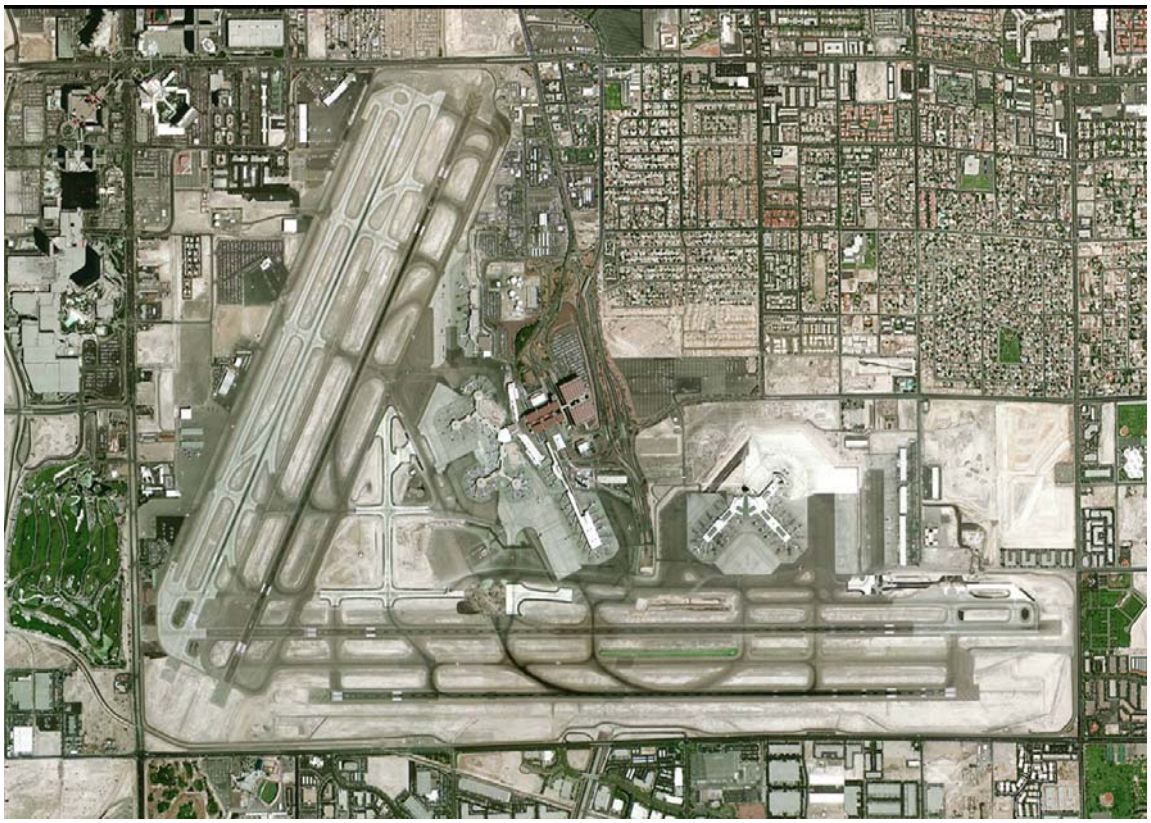
80 Ricondo & Associates, Final Environmental Assessment for the Construction of Terminal 3 at McCarran International Airport (Feb. 2004).

81 Ricondo & Associates, Project Definition Manual for the Construction of Terminal 3 (2003).

82 FAA, 2006 Terminal Area Forecast.

capacity at LAS is not dictated by ground access constraints, it is evident that the existing airport roadway network could not accommodate long-term forecasted regional demand and that the degree of expansion necessary to accommodate the projected number of visitors in the long-term is practically infeasible, given space constraints (*see* **Figure 3-11**), the prohibitive costs of land acquisition and the social costs associated with urban road expansion. Finally, while the ultimate terminal capacity at LAS (*i.e.*, capacity assuming completion of the ongoing Concourse D and Terminal 3 projects) does not currently constrain operations, CCDOA has determined that is not reasonable to expand landside facilities to the extent necessary to accommodate the long-term projected growth. Even if CCDOA were able to expand terminal facilities (at an unreasonable cost), the additional landside facilities would not provide additional capacity at the airport, because the *airfield* will reach its practical limit by 2018 or 2019.

FIGURE 3-11
MCCARRAN AIRPORT



Source: CCDOA (2006).

As outlined below, these constraints prevent CCDOA from expanding LAS in a manner that is sufficient to accommodate the long-term forecasted commercial service demand.

3.4.1.1 Airfield

When an airport needs additional capacity, the most common means of providing such capacity is to enhance the airfield by building new runways.[83] CCDOA has developed the airfield at LAS to the fullest extent feasible, however,[84] and there are no practical or feasible options for adding additional runway capacity at LAS. CCDOA has conducted exhaustive research over the past decade into the possibility of constructing one or more new runways both on and off existing airport property. The possible runway orientations considered were: (1) an east-west runway (7-25 alignment) south of Sunset Road; (2) an east-west runway (7-25 alignment) north of Russell Road; (3) a northeast-southwest runway (1-19 alignment) west of Las Vegas Boulevard; and (4) a northeast-southwest runway (1-19 alignment) south of Sunset Road and just east of Eastern Avenue.[85] *See* **Figure 3-12.** CCDOA has concluded that none of these scenarios is feasible or prudent.

First of all, existing constraints prevent construction of certain runway alignments. For example, tall buildings along the Las Vegas Strip affect the feasibility of constructing an additional runway west of the existing Runway 1-19 system at LAS, or a new northwest-southeast runway. S*ee* **Figures 3-7** and **3-8**.

Second, LAS is situated in proximity to the Las Vegas Strip, where land values have escalated dramatically as resort development has expanded. Even for the most optimal of the studied runway alignments (parallel east-west runways south of Sunset Road), the necessary land acquisition alone (depicted in **Figure 3-13)** would cost over $2.3 billion. In addition to the land costs, the southern runway expansion would require major realignment of transportation infrastructure, including both highways and the railroad. Moreover, any such expansion would generate a significant level of controversy from the existing residents and neighborhoods affected by approach and departure paths. That controversy would make a timely expansion project practically impossible. CCDOA has therefore concluded that it has developed the airfield (runway and taxiway complex) at LAS to the fullest extent possible, considering the available land and existing land use patterns around the airport.[86]

Moreover, the only potential options for providing additional capacity increases at LAS that would come close to accommodating forecast demand would be to abandon the informal runway use program, to allow operations on all runways during all hours of the day and night, and/or to develop additional airspace departure fixes and allow fanning of subsequent departures from departure runways. Each of these drastic measures could potentially provide some near-term capacity gains at LAS, but the increase in capacity would come at the high cost of increased

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83 FAA, Report to Congress: National Plan of Integrated Airport Systems (NPIAS) 2005-2009 (2004).

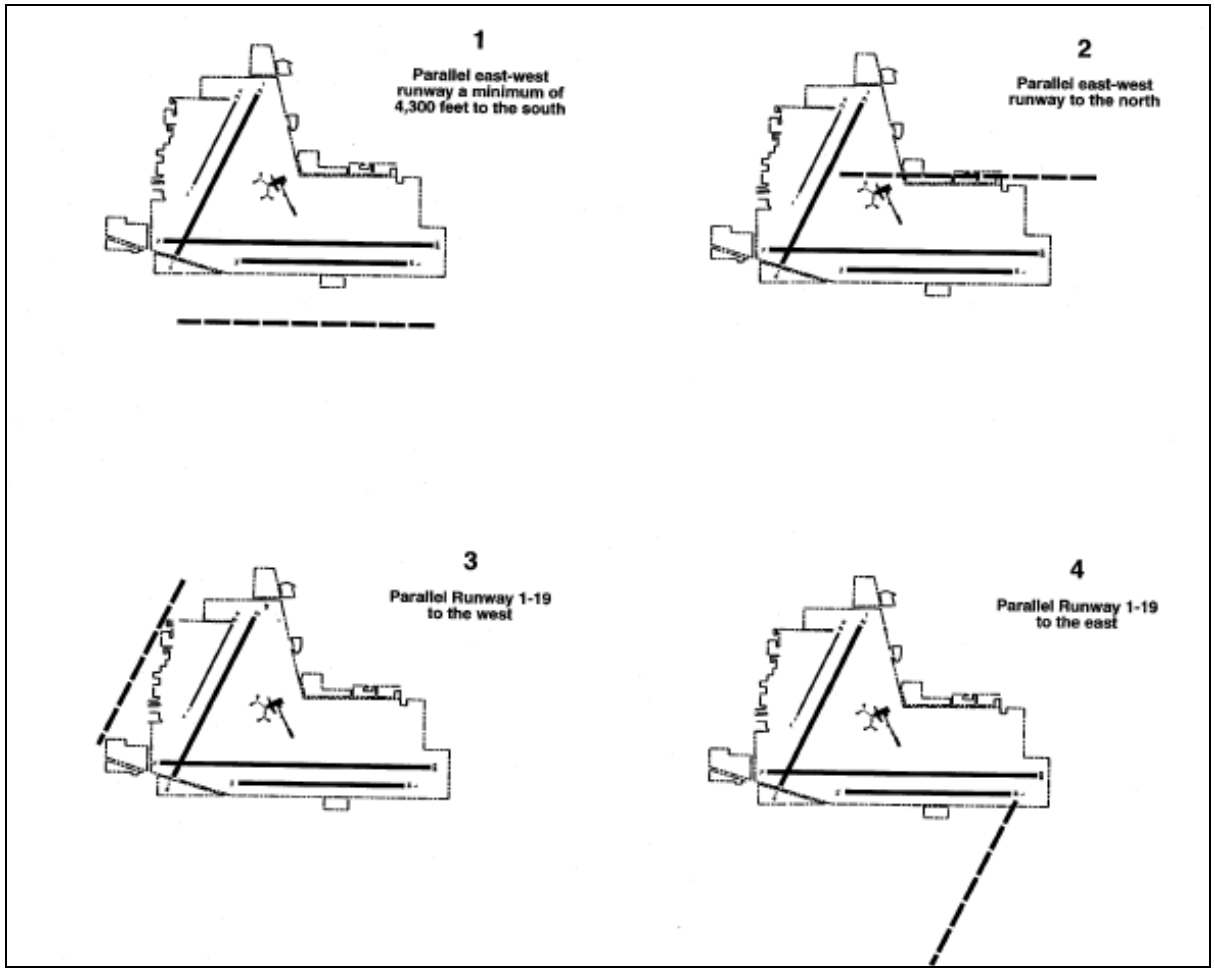
84 Ricondo & Associates, Final Environmental Assessment For the Construction of Terminal 3 (2004); HNTB, Southern Nevada Regional Airport System Plan (2006).

85 *E.g.*, Leigh Fisher Associates, *Final Environmental Assessment Upgrade of Runway 1L-19R McCarran International Airport* (1994).

86 Ricondo & Associates, Final Supplemental Environmental Assessment for the Construction of Terminal 3 (2005).

environmental impact. In addition, these changes may not be politically feasible due to residential development in areas surrounding the airport and the large public outcry that may result should these changes be proposed. Finally, while potentially providing near-term capacity gains, these measures would not provide the long-term capacity gain needed to support future demands for air travel in the Las Vegas metropolitan area. For example, while these measures may allow air traffic controllers to reduce separation between flights and thereby increase the frequency of arrivals and departures, minimum separation requirements will still limit frequency, especially since the runway pairs cross one another.[87] Even at maximum efficiency, the number, length and orientation of the runways would limit LAS's ability to accommodate the forecasted demand.

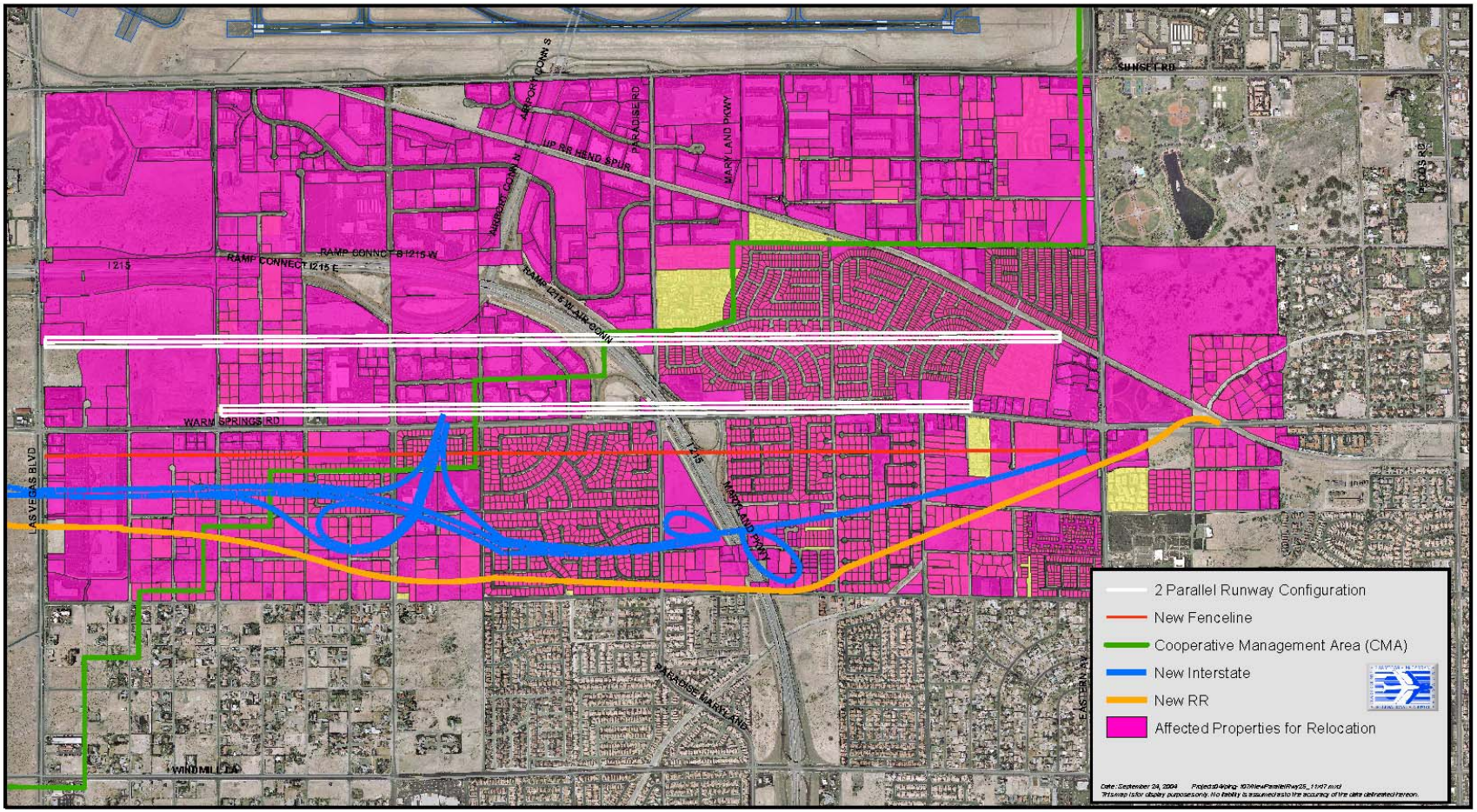
FIGURE 3-12
PROSPECTIVE RUNWAY ALIGNMENT(S)



Source: Final Environmental Assessment Upgrade of Runway 1L-19R McCarran International Airport, 1994.

[87] As noted in Section 3.3.1, FAA does not permit a reduction in minimum separation, including the reduced separation between flights that LAHSA would provide.

FIGURE 3-13
IMPACTS FOR ADDITION OF 2 PARALLEL RUNWAYS SOUTH OF RUNWAY 25L



Source: Ricondo & Associates, 2005

3.4.1.2 Airspace

CCDOA has no feasible means of relieving the existing airspace constraints dictated by tall structures, terrain and regulatory issues such as special use military airspace. Collectively, these constraints limit the operational flexibility and prevent CCDOA's ability to construct additional on-site runways.

Some existing tall structures are considered obstructions that require lighting and marking under current Federal Aviation Regulation (FAR) regulations. While these structures do not create hazards or safety concerns under current operating procedures, they do reduce the flexibility of the airport to implement certain capacity-enhancing procedures. For example, these tall structures affect the feasibility of constructing an additional runway west of the existing Runway 1-19 system at LAS. They also affect the feasibility of lengthening the 01/19 Runway complex.

In addition, high terrain west of LAS prohibits the establishment of an ILS approach from the west, due to the inability to provide proper separation between aircraft and the terrain. The construction of an additional runway in an east-west configuration (*i.e.*, 9-27) would be limited by the same conditions. High terrain south of the airport limits instrument landing system approaches to a glide slope angle of 3.4 degrees which is higher that the standard glide slope angle of 3 degrees. This higher glide slope angle results in a steeper descent and consequently prohibits aircraft in approach category D (*i.e.*, aircraft with approach speeds of 141 knots or higher, such as the B-777, DC-10 and B-747) from using this instrument approach.[88]

Finally, because of the restricted airspace and military operations areas north and west of LAS, the movement of commercial aircraft to and from the Las Vegas area is severely limited. These constraints limit CCDOA's ability to expand operations at LAS beyond the currently planned level.

3.4.1.3 Ground Access / Surface Transportation

The existing airport roadway network could not accommodate the long-term forecasted demand. Even absent any airport expansion, traffic volumes in the vicinity of LAS will continue to grow. Non-airport traffic alone is estimated to grow at an average annual rate of 1.5 percent.[89]

As passenger volumes continue to grow, improved roadway access to the airport would be necessary in order to accommodate the corresponding increase in both commuter and LAS-destined vehicles. Direct access from the Resort Corridor in the north via the intersection of Swenson/Paradise Road and Tropicana Avenue would be constrained by roadway geometry and

[88] CCDOA, Forecast of the Distribution of Aircraft Operations Between McCarran International Airport (LAS) and the proposed Ivanpah Valley Airport (IVP) (2006 Draft).

[89] Louis Berger Group, Inc., McCarran International Airport Traffic Study for the Proposed Terminal 3 (October, 2001).

the current operation of the traffic signals.[90] Northbound traffic would continue to be constrained by the capacity of the Airport Connector and Airport Connector Tunnel. Currently, the Sunset Road off-ramp adversely affects Airport Connector traffic due to the weaving problem caused by conflicts with I-215/Warm Springs Road and mainline I-215.[91]

While CCDOA has not examined the long-term (*i.e.*, 2020 to 2025) ground access shortages that would occur assuming that the unconstrained demand could be met at LAS, it is apparent that the surface transportation system would require significant improvements in order to accommodate long-term passenger demand at LAS. Given the surrounding land uses, any such improvements would be very costly and create serious impacts on the surrounding communities.

3.4.1.4 Terminal Facilities

While landside constraints do not currently limit the practical capacity at LAS, the expansion of terminal facilities would not resolve the long-term capacity need identified by CCDOA. First, CCDOA has determined that it cannot reasonably expand the physical terminal facilities beyond the currently-planned measures. Second, *whether or not CCDOA could provide additional landside capacity,* the airfield constraints would continue to limit the practical capacity of the airport.

3.4.1.4.1 Expansion of Existing and Planned Facilities

CCDOA has determined that further expansion of Terminal 1 is not reasonable. Concourses A, B, and C at Terminal 1 cannot be expanded without significant reconstruction or without expanding into the existing airfield.[92] CCDOA has already planned and is in the process of expanding Concourse D to its maximum potential. The existing southwest and southeast wings of Concourse D cannot be expanded without interfering with the existing airfield. In addition, as depicted in **Figure 3-14**, the northeast wing of Concourse D cannot be expanded because it would interfere with taxiways to Terminal 3 and would prevent sufficient depth being provided for development of international aircraft parking and passenger processing facilities in Terminal 3.[93] Reduction in the size of the taxiways would also prevent the ability to have dual Aircraft Design Group (ADG) IV aircraft taxiing between Concourse D and Terminal 3.[94] Finally, the planned northwest wing of Concourse D cannot be expanded to accommodate additional gates because of the existing underground water reservoir, which is located northwest of Concourse D, south of Russell Road and just north of the North Tunnel Portal.[95]

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90 Parsons, Groundside Access Capacity Study: Phase I: Evaluation of Existing Conditions and Residual Capacities (2003).

91 Parsons, Groundside Access Capacity Study: Phase I: Evaluation of Existing Conditions and Residual Capacities (2003).

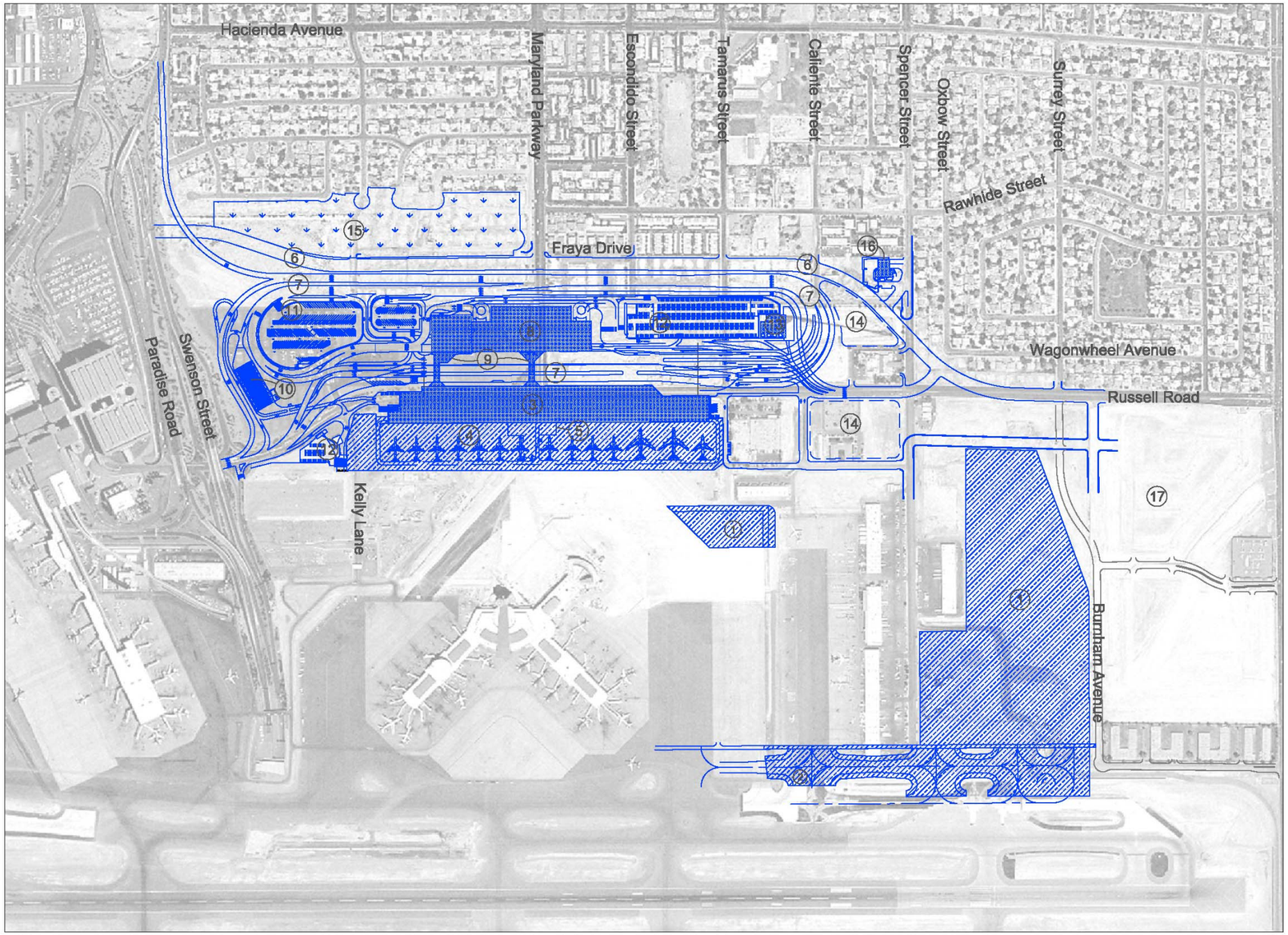
92 Ricondo & Associates, Final Supplemental Environmental Assessment for the Construction of Terminal 3 at McCarran International Airport (Sept. 2005).

93 Ricondo & Associates, Project Definition Manual Update for the Construction of Terminal 3 (Phase I) (2003).

94 Ricondo & Associates, Project Definition Manual Update for the Construction of Terminal 3 (Phase I) (2003).

95 Ricondo & Associates, Project Definition Manual Update for the Construction of Terminal 3 (Phase I) (2003).

FIGURE 3-14
PROXIMITY OF CONCOURSE D TO TERMINAL 3



Legend

1. New Remain Overnight Parking Apron
2. New Taxiway and Vehicle Service Road
3. New Terminal 3
4. New Aircraft Ramp at Terminal 3
5. Connection to Underground Tunnel for Automated People-Mover System
6. Relocated Russell Road
7. New Access / Recirculation Roadway
8. New Parking Garage
9. New Pedestrian Bridge
10. New Taxicab Staging with Canopy
11. New Bus / Limousine Staging
12. New Surface Parking
13. New Central Plant
14. New Detention Basin
15. New Landscape Buffer
16. Relocated Clark County Fire Station #19
17. Land Acquired Previously by the Department of Aviation (Not part of Proposed Action)

Note: The Russell Road/Burnham Avenue area was acquired by the Department of Aviation between 1992 and 2002 to allow for the expansion of Airport facilities and to promote land use compatibility in the Airport environs. According to the FAA-approved FAR Part 150 Noise Compatibility Program, residents living in this area were exposed to aircraft noise of DNL 70 to 75 dBA. All properties were acquired on a willing-buyer and willing-seller basis with the exception of two residences, which were condemned in 2000 and 2002.

Source: Ricondo & Associates, 2005

Terminal 2 cannot be expanded to the north because it is constrained by the existing fuel farm. FAA and National Fire Protection Association (NFPA) guidance documents require safe separation of the fuel storage site from aeronautical operational areas as well as other airport facilities and adjoining properties.[96] In addition, Terminal 2 cannot be expanded to the west because it would interfere with Runway 1R-19L. Finally, expansion south toward Terminal 1 would defeat the purpose because no more than a few (*i.e.*, two or three) gates could be added without a resulting loss of gates in Terminal 1 and subsequent reduction in level of passenger service.[97] The costs of expanding Terminal 2 therefore would greatly outweigh the benefits from a net gain of two or three gates and would not provide a long-term solution to the need for additional capacity.

The design and size of Terminal 3, which is in the process of being designed and constructed, is also limited by certain factors. First, a key purpose of the new terminal is to balance the capacity of the terminal facilities with the airfield.[98] With the completion of Terminal 3, the terminals will be able accommodate the estimated maximum number of operations that can be accommodated by the current airfield without excessive delay. Second, the new terminal cannot expand south towards Concourse D because it would interfere with taxiways to Terminal 3 and Concourse D and would prevent sufficient depth for development of international aircraft parking and passenger processing facilities in Terminal 3.[99] Finally, the new Terminal 3 cannot expand towards the east because of the significant grade change at the Tamarus alignment and because existing cargo and planned aircraft remain overnight (RON) parking would be displaced.[100]

3.4.1.4.2 Construction of Additional Terminal(s)

CCDOA has also determined that there are no feasible or practical options for constructing additional terminal facilities on other locations at the airport. CCDOA has evaluated the feasibility of constructing new terminal facilities at a location on the west side of the airport, near the intersection of Russell Road and Las Vegas Boulevard South. Although the west side alternative would provide additional gates and passenger processing facilities, the terminal would also be separate from the main terminal complex and would therefore not provide CCDOA with the necessary flexibility to serve the gates in the existing concourses or another passenger processing facility. Second, because of its location, a west side alternative could not provide landside support for the main terminal complex, and, therefore, would not relieve existing curbside, baggage claim and ticketing congestion at Terminal 1. Third, a west side alternative has significant practical impediments: the area does not have sufficient space for necessary RON parking positions, the area has poor landside access, and, most importantly, because of the

96 FAA AC 150/5230-4; NFPA Standard No. 30.

97 Ricondo & Associates, Final Supplemental Environmental Assessment for the Construction of Terminal 3 at McCarran International Airport (Sept. 2005).

98 Ricondo & Associates, Project Definition Manual Update for the Construction of Terminal 3 (Phase 1) (2003).

99 Ricondo & Associates, Project Definition Manual Update for the Construction of Terminal 3 (Phase I) (2003).

100 CCDOA (2005).

proximity of the Las Vegas Strip, the cost of necessary land acquisition would be impractical. Finally, constructing a west side terminal would displace existing facilities, which accommodate a mixture of tenants, such as Quail Air Center and Signature Flight Support, and a variety of users, including corporate aviation, air tour operators, and military operations.[101]

It is not reasonable to expand the existing east area at LAS to include additional terminal facilities. This area already accommodates air cargo facilities and is slated to be the site for the central receiving facility warehouse, airport commissary, the new main airfield access gate, [102] and necessary RON parking positions.[103] The RON parking positions are essential for accommodating aircraft not using actual gates at the airport. CCDOA has determined that, based on airlines' schedules at LAS, the need for the number of RON parking positions is approximately 70 percent of the number of gates at the airport.

Finally, development of terminal facilities in the north area at LAS is limited because of the existing fuel farm. CCDOA currently proposes to use the North Area to accommodate 40 acres of airside development, including RON parking positions, GSE vehicle parking and maintenance and 22 acres of employee and Terminal 2 automobile parking and commercial vehicle staging areas. CCDOA also plans to use the North Area to accommodate economy parking lots. [104]

Moreover, even if it were feasible (both financially and practically) to expand terminal space and thereby increase the number of gates at LAS, CCDOA has calculated that additional gates would have no significant effect on long-term average annual delays. Specifically, TAAM experiments for LAS operations were conducted assuming the addition of a new terminal with 8 additional gates. A theoretical fourth terminal was assumed to be located to the north of the existing Terminal 2. The TAAM experiments made the following assumptions:

- The additional gates were attached to the baseline taxiway/taxilane system through an independent parallel taxilane which would not interfere with aircraft queuing on taxiway D adjacent to Runway 19L for departure.

- The gates were designed as open for use by any airline and sized to accommodate the largest aircraft types, but placed at the bottom of the gate priority list in the Airport usage file such that they would only be used if all baseline gates were already in use.

- The TAAM experiment was run for LAS operations in the 19-25 Runway use configuration. This configuration is relevant because it is historically in use during over

[101] Ricondo & Associates, McCarran International Airport Consolidated Land Use Plan (2005); Ricondo & Associates, Final Supplemental Environmental Assessment for the Construction of Terminal 3 at McCarran International Airport (Sept. 2005).

[102] Because of the location of the new Terminal 3 and the significant grading work necessary for the construction of the northwest wing of Concourse D, the existing "South Gate" will no longer be available as the access point for the airfield, air cargo buildings, and other airline-related facilities.

[103] Ricondo & Associates, McCarran International Airport Consolidated Land Use Plan (2005).

[104] Ricondo & Associates, McCarran International Airport Consolidated Land Use Plan (2005).

80 percent of the year and has the highest sustainable arrival rate. This configuration also has the highest gate demand of any of the runway use configurations.

The results of these TAAM experiments showed that there were some capacity advantages in the near-term. In the long-term (*i.e.,* 2025) however, the baseline gates did not fill to capacity even given the rules restricting certain airlines to specific gate chains and aircraft of certain sizes to specific subsets of gates. The experiments demonstrate that the additional gates from a theoretical fourth terminal remained unutilized in 2025, and the average delay results for 2025, assuming the additional terminal, were essentially identical to the results of the baseline experimental runs (*i.e.*, 2025 scenario without the fourth terminal). These results are not unexpected, given certain critical airfield constraints: (1) the maximum sustained acceptance rate in the 19-25 Runway use configuration is about 50 to 60 arrivals per hour; (2) not all arriving operations use air carrier gates: some use cargo gates and some use GA gates; (3) the typical turn around time for air carrier flights is on the order of 2 hours or less; and (4) not all aircraft can use all gates at LAS.

Given these factors, CCCDOA has made the following rough calculation of the maximum gate demand sustainable at LAS:

(55 arrivals/hour) X
(2 hours turnaround time) X
(90% of arrivals use passenger gates) X
(multiplication factor of 1.1 or 1.2 to account for inability of some aircraft to use all gates at LAS)
= 109 – 119 gates

This calculation demonstrates that the designed gate capacity of the planned build-out of LAS (*i.e.,* 117 gates upon completion of the construction at Concourse D and the construction of new Terminal 3) is, in fact, equivalent to the maximum sustainable gate demand at the airport. Therefore, construction of additional terminal facilities and gates beyond the currently planned measures would neither reduce average delays nor resolve long-term capacity limits.

3.4.2 Expansion at Other Regional Airports

A second option to address the need for supplemental commercial air service capacity to serve Las Vegas would be to expand one of the existing regional airports that are within or near the metropolitan area. As described below, however, none of these airports is well-suited to accommodate the level of expansion necessary to satisfy the long-term forecasted demand for commercial service to the metropolitan area. In addition, expansion of commercial service to these airports would be impractical since it would displace existing uses and activities and would

require the associated development of other new facilities to accommodate the displaced facilities and activity in order to maintain overall system-wide capacity.[105]

3.4.2.1 CCDOA-Operated Airports

North Las Vegas Airport. CCDOA has planned and developed the airport to be a first class reliever to LAS. In that role, the airport accommodates the lower performance general aviation aircraft – operations that would otherwise occur at LAS – thereby reducing delays and airfield congestion at LAS.[106] North Las Vegas also serves both corporate and private general aviation activity and accommodates air tour and sport aviation operators.

The current airfield at North Las Vegas is not designed to accommodate aircraft greater than Design Group II, and therefore cannot currently accommodate the forecasted commercial aviation demand for the Las Vegas metropolitan area, which would include Design Group VI aircraft. In addition, the general aviation aircraft which typically operate at North Las Vegas operate at much slower speeds than commercial service aircraft. Therefore, expansion of the general aviation airfield to accommodate commercial service activity would lead to inherent operational interactions that would limit the operational potential at the airport. Moreover, the airfield at North Las Vegas is constrained, because of surrounding land uses. The North Las Vegas Airport also has demand for additional aircraft basing areas, including a growing demand for blimps during conventions and promotional events.[107]Therefore, North Las Vegas Airport could not accommodate the projected commercial service demand without extensive land acquisition and the purchase of homes, which would have the effect of significantly undermining the existing community.

Henderson Executive Airport. The potential for expansion of commercial service at Henderson Executive Airport is limited. First of all, CCDOA has planned and developed this airport to serve as another first-class reliever to LAS. Toward that end, over the last five years, CCDOA has improved ground access to the airport, replaced the existing runway with a set of new parallel runways, added additional ramp space and hangar space, and designed and had two new instrument approaches published. CCDOA is also in the process of developing a new terminal facility to support corporate and general aviation operations.

In furtherance of Henderson's role as a reliever airport, CCDOA has limited Henderson Executive Airport to accommodating aircraft designated as approach category A and B, and weighing no more than 75,000 pounds. Moreover, like North Las Vegas Airport, the airfield at Henderson is constrained by surrounding land uses. Henderson Executive Airport could not accommodate the projected commercial service demand without extensive land acquisition

[105] HNTB, Southern Nevada Regional Airport System Plan (2006); Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
[106] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
[107] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).

and/or condemnation, which would have the effect of significantly undermining the existing community. In addition, the general aviation aircraft which typically operate at Henderson operate at much slower speeds than air carrier aircraft. Therefore, expansion of the general aviation airfield to accommodate commercial service activity would lead to inherent operational interactions that would limit the operational potential at the airport.[108]

Jean Airport. For safety and efficiency reasons, Jean Airport's role of accommodating sport aviation is inconsistent with commercial aviation.[109] In fact, the Ivanpah Valley Airport Public Lands Transfer Act of 2000 requires Clark County to maintain Jean Airport for general aviation activity.[110] Accordingly, CCDOA has entered into an Agreement with the BLM, under which CCDOA is obligated to maintain and operate Jean Airport for general aviation purposes so long as FAA determines that it is safe to conduct such operations. In the event that FAA makes a determination that the Jean Airport cannot be operated safely, CCDOA is obligated to provide necessary alternative facilities and services at other aviation facilities to enable users of Jean Airport to conduct operations at approximately the same level that had been conducted prior to such determination.[111]

Overton Municipal Airport-Perkins Field. Expansion of the airfield at Perkins Field to accommodate commercial service activity is not practical for several reasons. First, such expansion would lead to inherent operational interactions with the existing general aviation operations. Second, the land acquisition necessary to expand this airport sufficiently to accommodate projected commercial service demand to the region would be incompatible with surrounding land uses and would undermine the existing community. Finally, the airport is located sufficiently far from the economic center of the Las Vegas metropolitan area that it is not a reasonable location for accommodating the projected commercial service demand to the metropolitan area.

3.4.2.2 Airports Not Operated by CCDOA

Boulder City Municipal Airport. The general aviation and sport aircraft which typically operate at Boulder City Municipal Airport operate at much slower speeds than air carrier aircraft. Therefore, expansion of the airfield to accommodate commercial service activity would lead to inherent operational interactions that would limit the operational potential of the airport.[112] Moreover, like Henderson and North Las Vegas, the airfield at Boulder City is constrained by surrounding land uses and could not accommodate the projected commercial service demand without significant impacts on the existing community. Importantly, Boulder City has also

[108] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
[109] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
[110] Pub. L 106-362 at § 2(b).
[111] Agreement between Clark County, Nevada and the United States Department of the Interior, Bureau of Land Management Regarding the Jean Airport (2003).
[112] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).

historically and consistently opposed the type of development within its jurisdiction that would be necessary to expand the airport.[113] As a result, this airport is not a reasonable candidate for accommodating the commercial service demand projected for the metropolitan area.

Laughlin/Bullhead International Airport. Laughlin/Bullhead Airport is affected by high temperatures and corresponding high-density altitude, and terrain constraints that limit the ability to further extend the runway and that limit the ability to use the runway for operations in both directions. The runway length, combined with the high altitudes and high summer temperatures occasionally limit the ability for air carrier jet aircraft to depart with full passenger or cargo loads. In some cases, air carrier jet aircraft have not been able to depart for several days until temperatures have decreased. For these reasons, and because the airport is located excessively far from the Las Vegas metropolitan area, it is not a reasonable location for accommodating the projected commercial service demand to the metropolitan area.[114]

Mesquite Municipal Airport. As noted above in **Section 2.5.3**, the City of Mesquite has proposed the development of a new airport that will be located about 15 miles west of Mesquite. The original plan for the new airport was to provide necessary space for the development of facilities to accommodate scheduled commuter, air carrier, and charter aircraft operations, and also to accommodate demand by corporate and general aviation aircraft. FAA, however, has concluded that only a replacement general aviation facility is warranted at this time. FAA is currently preparing an environmental impact statement (EIS) to determine the environmental impacts and feasibility of the new replacement general aviation airport. A draft EIS is expected to be completed in late 2006 or early 2007. [115]

Nellis Air Force Base. Nellis Air Force Base (AFB) is an active military airport. It is surrounded by dedicated airspace, including MOAs and MTRs, allowing high-speed maneuvering and bombing practice which would be extremely hazardous to civilian aircraft. In addition, the use of the primary departure path of Nellis AFB by commercial service aircraft would lead to operational conflicts with north-south arrivals at LAS due to their lower climb performance compared to military aircraft. This airspace conflict would limit the capacity of both airfields. Moreover, there are no plans by either the Department of Defense or the U.S. Congress to limit use of Nellis AFB. No commercial use of Nellis AFB is therefore feasible at this time.[116]

3.4.3 No Action

Under a no action scenario, it is anticipated that aircraft operations at LAS would become constrained as average delays approached the 20 minute per operation level, at which point, the

[113] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
[114] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
[115] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).
[116] Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).

practical capacity of the airfield would be reached.[117] To examine and understand the no action scenario, CCDOA commissioned a Constrained Forecast, which was developed by modifying the Unconstrained Forecast under various assumptions of air carrier behavior when traffic levels approach and reach an average annual delay of 20 minutes per operation at LAS.[118] The list of assumptions used to develop the Constrained Forecast was based upon historical and recent data and trends, and airspace simulations. The assumptions and general considerations addressed topics such as the anticipated reactions by air carriers to increasing delays, the period of time over which such actions would be likely to occur, and the flexibility for aircraft operators to respond through the use of different aircraft types.

- **Fleet Mix.** There has been some discussion that the average passenger capacity of the fleet of aircraft serving Las Vegas may tend to up-gauge or get larger as the average delay per aircraft operation approaches 20 minutes per aircraft operation. However, (1) in general, airlines do not plan their fleet make-up based on a single airport; and (2) the airlines accounting for the majority of air carrier operations at LAS have relatively homogeneous fleets and, based on known orders, are expected to continue to maintain similar fleets. Within the air carrier, cargo, commuter, military, and charter portion of the fleet, therefore, the Constrained Forecast concluded that even when demand is constrained, the fleet mix will not change appreciably beyond that change that is already included in the Unconstrained Forecast. Within the general aviation fleet, the Constrained Forecast assumes that 100 percent of single engine piston aircraft and 50 percent of twin engine piston aircraft would relocate to Henderson Executive or North Las Vegas airports in 2018/2019 and beyond. Based on the results of the airfield simulations and capacity analyses,[119] each shift of 1.7 general aviation aircraft operations from LAS would allow 1 additional commercial service operation to be accommodated at the airport. There would not be a one-for-one replacement because greater separations are required between larger commercial aircraft operating on a runway than are required between smaller general aviation aircraft.
- **Load Factor.** As average delays per operation increase, carriers may try to increase the load factors on their current flights, rather than adding new flights into LAS. This is unlikely to occur at LAS beyond that already included in the Unconstrained Forecast, however, because LAS already has the second highest average load factor (76.8%) among the 20 busiest U.S. airports. Only Miami International Airport has a higher average load factor (77.2%) than LAS. Nonetheless, the Constrained Forecast assumes that the load factor for scheduled domestic flights would increase to as high as 80% after 2018/2019 (contrasted with 76% shown in the Unconstrained Forecast document), under the constrained condition.

[117] FAA, Airport Benefit-Cost Analysis Guidance (1999).
[118] Ricondo & Associates, Constrained Forecast of Aircraft Operations, McCarran International Airport (2006).
[119] Ricondo & Associates, *Development of Unconstrained Total Airspace and Airport Model (TAAM) Simulation Timetables, TAAM Simulation Results, and Annualization of TAAM Simulation Results* (2006).

- **Turns per Gate.** Another way for carriers to increase operations at an airport that is constrained by terminal facilities is to increase the number of turns per gate per day (*i.e.*, the number of flights) and the number of hours in which they operate, resulting in more passenger movements per gate per year. This is unlikely to affect the constrained condition at LAS however, because CCDOA is constructing terminal facilities that can accommodate up to 52.6 MAP at a processing rate of approximately 450,000 passengers per year per gate. The Constrained Forecast assumes that gate/terminal throughput would not further constrain demand beyond the 20 minutes of average delay per aircraft operation caused by airfield constraints.
- **De-peaking or Distribution of Demand.** One way in which airlines can try to reduce delay at constrained airports is to spread out demand so that it is more even throughout the day, resulting in fewer demand peaks. This strategy is unlikely to provide significant relief at LAS, however, as it is a spoke (*i.e.*, destination) in most of the carriers' hub and spoke system and therefore subject to the schedules developed for operations at the airlines' hub airports. In addition, there are few hours during the day during which activity is significantly lower than the peak hour. The Constrained Forecast therefore concludes that there would be no change in the distribution of aircraft operations in and beyond 2018/2019.
- **Growth Beyond 2018/2019.** When the average delay per aircraft operation at LAS approaches 20 minutes, it is assumed that operational demand will taper off. Demand for travel to Las Vegas could continue to increase as fares increase and stimulate additional service by carriers regardless of additional operating costs caused by high delays. However, it is reasonable to assume no growth in demand beyond the point at which the average delay per aircraft operation reaches 20 minutes.

Table 3-7 presents the constrained forecasts using the conclusions and assumptions outlined above. As shown, 20 minutes of delay will occur at LAS when total aircraft activity reaches 770,909 total operations, which is forecasted to occur in 2018/2019. As discussed earlier, it was assumed that 100 percent of single engine piston GA aircraft and 50 percent of twin engine piston GA aircraft would relocate to Henderson Executive or North Las Vegas airports when 20 minutes of delay were reached at LAS (a total of 18,373 GA operations). Each shift of 1.7 general aviation aircraft operations from LAS would allow 1 additional commercial service operation to be accommodated at LAS (a total of 10,808 additional commercial service operations). For these analyses, the Unconstrained Forecast of commercial service operations (Air Carrier, Commuter, and Cargo) was maintained in 2019 by relocating 18,373 GA operations. The remainder of the commercial service operations was allocated based on the Unconstrained Forecast split in 2020. Except for helicopter air tour operators, which were assumed to be unaffected by the 20 minutes of airfield delay, aircraft operations at LAS were held constant between 2020 and 2025.

TABLE 3-7
CONSTRAINED FORECAST OF TOTAL AIRCRAFT OPERATIONS AND SIMULATED AVERAGE DELAY PER OPERATION AT LAS

Year	Air Carrier	Commuter	Cargo	Air Tour	GA	Military	Total	Simulated Average Delay (min/op)
2004	357,388	16,800	6,436	89,393	70,000	2,200	542,217	2.7
2005	363,185	16,495	6,760	93,018	71,730	2,000	553,188	3.6
2006	371,852	20,105	7,280	96,836	71,283	2,000	569,356	4.2
2007	380,634	23,691	7,280	100,618	70,886	2,000	585,109	4.8
2008	390,360	25,016	7,280	104,618	70,536	2,000	599,810	5.5
2009	400,635	25,836	7,800	108,800	70,230	2,000	615,301	6.3
2010	408,776	25,748	8,320	113,200	69,964	2,000	628,008	6.9
2011	419,626	26,445	8,320	117,818	69,738	2,000	643,947	7.9
2012	431,076	26,594	9,360	122,400	69,548	2,000	660,978	9.0
2013	442,657	27,249	9,360	127,200	69,393	2,000	677,859	10.3
2014	454,352	28,810	9,880	132,436	69,272	2,000	696,750	11.9
2015	457,611	30,193	9,880	137,818	69,182	2,000	706,684	12.8
2016	470,280	30,712	10,192	143,814	69,178	2,000	726,176	14.7
2017	482,216	32,162	10,504	149,810	69,174	2,000	745,866	16.9
2018	495,474	33,668	10,816	155,805	69,170	2,000	766,933	19.4
20-minutes average delay per operation	497,870	34,079	10,874	156,918	69,169	2,000	770,909	20.0
2019	506,770	35,768	11,093	161,801	50,796	2,000	768,227	20.0
2020	506,770	35,768	11,093	167,797	50,796	2,000	774,223	20.0
2021	506,770	35,768	11,093	175,097	50,796	2,000	781,523	20.0
2022	506,770	35,768	11,093	182,397	50,796	2,000	788,823	20.0
2023	506,770	35,768	11,093	189,697	50,796	2,000	796,123	20.0
2024	506,770	35,768	11,093	196,997	50,796	2,000	803,423	20.0
2025	506,770	35,768	11,093	204,297	50,796	2,000	810,723	20.0
CAGR (2004 - 2025)	1.7%	3.7%	2.6%	4.0%	-1.5%	-0.5%	1.9%	

Source: Ricondo & Associates, Inc. (2006).

Table 3-7 shows that, if general aviation operations did not relocate, 532,000 annual commercial service operations (*i.e.*, air carrier and commuter) could be accommodated at LAS at the point that the airport reached an average annual delay of 20 minutes. Once 20 minutes of average annual delay was reached (*i.e.*, by 2019), the Constrained Forecast assumes that general operations would relocate, at which point LAS could accommodate approximately 542,500

commercial aircraft operations per year. This scenario therefore does not satisfy the long-term and growing demand for commercial air service in the Las Vegas metropolitan area.

3.4.4 Conclusions

CCDOA has developed LAS to provide commercial service to the Las Vegas metropolitan area, and has developed alternative facilities to accommodate the needs of other aviation users in the Las Vegas region in a manner that alleviates constraints on commercial service operations.[120] LAS is already ranked as the 6th busiest airport in the nation, however, and is the second busiest O&D airport, trailing only LAX.[121] Moreover, the Unconstrained Forecast predicts that growth in demand for commercial service to the metropolitan area will continue at above-average rates. CCDOA's TAAM simulations show that the airport will reach its practical capacity by 2018 or 2019.

Given historical growth patterns, current projections for future growth, and recent TAAM simulations, the need for supplemental commercial air service capacity is apparent. CCDOA is not alone in identifying this need. FAA, too, has recognized Las Vegas as one of 8 metropolitan areas needing additional capacity by 2020, based on airfield configuration, airspace limitations, and the growing volume of activity.[122]

LAS does not have the capacity to accommodate the projected long-term (*i.e.*, 2020 – 2025) demand for commercial service.[123] Expansion of commercial service to any of the existing regional airports is also not reasonable: it would displace existing users and activities and would undermine overall system-wide capacity. In the event that CCDOA took no action to increase capacity, average annual delay at LAS would exceed 20 minutes per operation by approximately 2018/2019, at which point activity would be constrained. The result would be a system-wide net loss of approximately 250 daily take-offs and landings by 2025.

Therefore, CCDOA has concluded that constructing a supplemental commercial service airport is the only option that accommodates long-term passenger demand in the metropolitan area. Given the long lead-time required to construct new facilities, the need to move forward with CCDOA's Proposed Action is urgent.

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120 HNTB, Southern Nevada Regional Airport System Plan (2006).

121 CCDOA (2006).

122 FAA, *Capacity Needs in the National Airspace System: An Analysis of Airport and Metropolitan Area Demand and Operational Capacity in the Future*, (2005) at 9.

123 *See also* Ricondo & Associates, Constrained Forecast of Aircraft Operations, McCarran International Airport (2006); CCDOA, Forecast of the Distribution of Aircraft Operations Between McCarran International Airport (LAS) and the proposed Ivanpah Valley Airport (IVP) (2006).

4 PROJECT DEFINITION

4.1 OVERVIEW: THE PROPOSED ACTION

CCDOA is proposing to construct, own, and operate a new supplemental commercial service airport in the Ivanpah Valley to accommodate the growing commercial and cargo air traffic demands of the Las Vegas metropolitan area at least through the year 2035.[124] The proposed location (the Site) encompasses a total of 6,000 acres which land was transferred to the County pursuant to the Ivanpah Valley Airport Public Lands Act of 2000 (Lands Act).

The Proposed Action includes the transfer of an additional 17,000 acres of current BLM land to Clark County once construction of the airport is approved under the Lands Act.[125] The Proposed Action would also involve actions outside of the Site, including construction of roadways and access points, highway interchanges to connect the Site to I-15, construction of necessary drainage facilities, utility connections, and excavation of gravel fill from off-site pits.

4.2 HISTORY OF THE IVANPAH AIRPORT PROJECT

In the 1990s, it became increasingly evident that LAS would not have sufficient capacity to accommodate the growing demand for commercial service to the Las Vegas metropolitan area. Recognizing the long lead-time necessary for such a project, civic leaders held discussions throughout the mid-1990s to discuss solutions to the capacity problem and concluded that the only apparent solution at that time that would secure capacity that could support the tourist economy was a new supplemental commercial service airport. In the course of these discussions, it became apparent that the Ivanpah Valley was the optimal site for the new airport because it is located within 30 miles of the economic center of the metropolitan area, has favorable topography and orientation, is located a safe distance from constrained airspace, and is close to existing transportation infrastructure.

4.2.1 Congressional Action

Because all the potential airport sites in the Ivanpah Valley were under the jurisdiction of the Department of the Interior, CCDOA sought federal approval for the necessary land transfer. As part of that process, the United States Congress has reviewed the Proposed Action in detail. Legislation was first introduced in 1998,[126] and was ultimately enacted in 2000, when Congress passed the Lands Act, which mandated the sale of land in the Ivanpah Valley for the purpose of

[124] Resolution of the Clark County Board of Commissioners Adopting the Sponsor's Proposal for the Development of a Supplemental Commercial Service Airport in the Ivanpah Valley (2005).

[125] Clark County Conservation of Public Land and Natural Resources Act of 2002, Pub. L. 107-282 § 501 (2002).

[126] *See* The Ivanpah Valley Airport Public Lands Transfer Act, H.R. 3705, 105th Cong. (1998); Ivanpah Valley Airport Public Land Transfer Act, S. 1964, 105th Cong. (1998); Omnibus National Parks and Public Lands Act of 1998, H.R. 4570, 105th Cong. (1998).

developing an airport and related infrastructure.[127] In doing so, Congress recognized that Clark County was the "fastest growing metropolitan area in the Nation," that LAS is "quickly exceeding capacity" and that "[t]he exorbitant growth in development and tourism has made the need for another airport in the Las Vegas metro area absolutely critical."[128] Congress also found that the Ivanpah Valley is "an ideal place to build a new airport" because of its proximity to Las Vegas, its favorable topography and orientation, its safe distance from constrained airspace, and its proximity to existing highway and railroad infrastructure.[129] Ultimately, Congress opted to bypass traditional federal land use planning and land disposal requirements associated with the management of public land, and mandated that the Secretary of the Interior convey lands in the Ivanpah Valley to Clark County "for the purpose of developing an airport facility and related infrastructure."[130]

In addition to enacting the Lands Act, Congress enacted the Clark County Conservation of Public Land and Natural Resources Act of 2002.[131] In that statute, Congress directed the Department of the Interior to establish a transportation and utilities corridor between the Las Vegas Valley and the proposed Ivanpah Airport site for the placement of utilities and transportation. The statute also directed the BLM to transfer to Clark County an additional 17,000 acres that has been identified as the Ivanpah Airport noise compatibility buffer area. Congress directed the transfer to take place, at Clark County's option, once the construction of the Ivanpah Valley Airport has been approved pursuant to the Lands Act. Because the transfer of the 17,000 additional acres is tied directly to the approvals for the Ivanpah Valley Airport, this transfer is considered to be part of the Proposed Action.

4.2.2 The Site Evaluation Study

Following passage of the Lands Act, CCDOA initiated subsequent efforts to confirm its initial findings regarding potential site(s) for supplemental commercial air service capacity. In the wake of the events of September 11, 2001, CCDOA commissioned a study to reevaluate and confirm its original findings regarding the Ivanpah Site and the need for a new commercial service airport. That study, the 2005 *Site Evaluation Study*, prepared by Ricondo & Associates, examined 16 alternatives, including expansion at each of the ten existing airports (McCarran, North Las Vegas, Henderson, Jean, Overton, Searchlight, Boulder City, Mesquite, Nellis and Laughlin/Bullhead) and construction of an entirely new facility at six different locations (the Ivanpah Valley, the Moapa Reservation, the Eldorado Valley, Indian Springs, the Pahrump Valley, and Apex). The key criteria identified in the *Site Evaluation Study* were: (1) terrain; (2) driving distance to the economic center of Las Vegas; (3) sufficient distance from urban areas or

[127] Pub. L 106-362.
[128] 146 Cong. Rec. H765 (daily ed. Mar. 9, 2000) (statement of Rep. Hansen, sponsor of substitute amendment agreed to and passed by the House).
[129] S. Rep. 106-471 at 2. (2000).
[130] Pub. L 106-362 at § 2(a).
[131] Pub. L. 107-282 § 501.

land already developed for commercial or residential uses to avoid conflicts due to aircraft noise or other environmental factors; (4) availability of land for acquisition; (5) distance from environmentally sensitive areas; (6) distance from restricted and special use airspace; and (7) suitability of land for airport development.

Ultimately, the *Site Evaluation Study* found that fourteen of the options studied (expansion at all ten existing airports in the regional system and construction of four of the candidate airport sites) were not feasible or practical alternatives because of location, availability of land for development, and surrounding land use constrains.[132] The Study concluded that only the Ivanpah Valley and the Eldorado Valley met the necessary criteria for supplemental commercial air service capacity.[133]

CCDOA subsequently prepared a technical supplement to the *Site Evaluation Study* that documented the fact that the Eldorado Valley was not a feasible or practical option. First, although the Eldorado Valley site could technically accommodate the proposed new airport, the site is not practicably available. CCDOA does not own the land in question and Boulder City has made evident that it does not support the sale or development of the land for a new airport. Second, Boulder City has set aside the Eldorado Valley Transfer Area for public recreation and to protect open space and habitat for endangered species and other wildlife. The relevant land was originally transferred to the City to be used for a desert tortoise preserve and is currently dedicated to public recreation, open space and multi-species habitat, and limited solar energy projects. For that reason, the City opposes both the sale of the property and the development of the property in the Eldorado Valley for the purpose of constructing a new airport.[134] In October, 2005, the City Manager informed CCDOA that "it would be reasonable to assume that land would not be made available by Boulder City for [the purpose of constructing a new airport]."[135] In fact, even if the City Council supported the Eldorado Valley as a candidate airport site, final approval would not be guaranteed, because the City Charter requires voter approval for any development within the Eldorado Valley Transfer Area. Moreover, construction of a new airport at the Eldorado Valley candidate site would have a direct adverse effect on existing public and recreational land, including environmentally sensitive areas containing important habitat.[136]

Based on the conclusions in the *Site Evaluation Study* and the supplemental technical memorandum, CCDOA has concluded that in order to provide the necessary supplemental capacity, the only feasible and prudent alternative is to construct a new supplemental commercial service airport in the Ivanpah Valley.

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132 Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).

133 Ricondo & Associates, Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (2005).

134 Letter from Vicki G. Mayes, City Manager, City of Boulder City to Randall Walker, Director of Aviation, CCDOA (Oct. 26, 2005).

135 Letter from Vicki G. Mayes, City Manager, City of Boulder City to Randall Walker, Director of Aviation, CCDOA (Oct. 26, 2005).

136 CCDOA, Supplement to the 2005 Site Evaluation Study for Supplemental Airport Capacity in Southern Nevada (November 2005).

4.2.3 May 2005 Resolution

On May 3, 2005, the Clark County Board of County Commissioners (BOCC) adopted a resolution setting forth and adopting the County's proposal to develop, construct and operate a new supplemental commercial service airport in the Ivanpah Valley. Considering that the regional economy is driven by the tourism and convention business and that the ability of the regional airport system effectively and efficiently to handle commercial passenger activity into the foreseeable future is critical to support the vitality of the business community and resident population of the Las Vegas metropolitan area, the BOCC determined that:

- It is not feasible to expand commercial service at LAS sufficient to accommodate the growing demand because of restricted airspace north of Las Vegas reserved for military uses, existing precision instrument landing requirements, surrounding terrain and land uses, and cost concerns; and expansion of any of the other airports in the system would displace existing uses and existing activity and therefore exacerbate rather than reduce system-wide restraints.
- A new airport is necessary to accommodate the forecasted demand.
- The County has studied and confirmed the suitability of the Ivanpah Valley site for the proposed supplemental airport and further determined that the Ivanpah site appears to best serve the County's needs at a lower cost and with fewer environmental impacts than other candidate locations.[137]

4.3 THE ROLE OF THE NEW AIRPORT

CCDOA's chief objective is to ensure sufficient long-term commercial air service capacity to the Las Vegas metropolitan area. Toward that end, the role of IVP is to accommodate the level of forecasted demand that exceeds the target activity level at LAS (*i.e.*, a throughput of 450,000 passengers per constructed gate, or 52.6 million annual passengers).

While CCDOA has not adopted any formal policy on distribution of traffic between LAS and IVP, it assumes that LAS will continue to serve the majority of the short- and medium-haul commercial air service routes. The new airport, by contrast, is expected to serve primarily long-haul air service to more distant domestic and international locations. CCDOA does not, however, expect that LAS will serve exclusively short-haul flights, or that IVP would serve exclusively long-haul flights. Carriers may make decisions based on factors such as cost, convenience, and the desire to avoid splitting operations, which factors may be relevant in determining the final distribution of operations between the two airports. Moreover, non-signatory carriers and domestic charters and other low cost carriers should be expected to operate both long and short-haul flights out of the Ivanpah airport. For that reason, the forecast for 2025 enplanements is not entirely a function of the number of available seats on long-haul operations

[137] Resolution of the Clark County Board of Commissioners Adopting the Sponsor's Proposal for the Development of a Supplemental Commercial Service Airport in the Ivanpah Valley (May 2005).

forecasted for the Las Vegas metropolitan area. In fact, a precise calculation and breakdown of 2025 enplanements is not possible, because current service patterns at LAS are not a perfect indicator of future conditions, traffic growth, and other factors that are unknown for a 20-year period. As a result, the new airport will need to accommodate the demands of larger aircraft (design groups IV, V and VI).

In addition to operations by scheduled carriers, the new airport will also support a nominal level of general aviation and military activity. However, the itinerant general aviation will likely prefer the existing reliever airports where convenient first-class facilities are already in place. Therefore, CCDOA expects that general aviation and military operations will be comprised predominantly of training, *i.e.*, local, operations, which will be better suited to the new airport because of its available capacity and low levels of delay. CCDOA anticipates that at opening, these activities would account for several thousand operations, which number would grow slowly over time.

Air cargo activity at the new airport will be, as it is at LAS, largely composed of belly cargo carried by the passenger airlines. Belly cargo has been and will continue to be important to scheduled carriers' financial success in the Las Vegas market. Additionally, all-cargo freight operations have traditionally been a very small percentage of the operations at LAS due to the limited airport/airspace capacity, the lack of leasable land, and the fact that there is little to no outbound cargo from the Las Vegas metropolitan area. It is anticipated that the existing cargo operations could be a viable segment of operations at the new airport. The integrated cargo carriers, such as FedEx and UPS are less likely to relocate to a new airport since their business model requires direct access to local commerce.[138]

4.4 FACILITIES REQUIREMENTS

CCDOA is currently reviewing two alternative layouts for the new airport: a "west airfield" alternative with two narrowly spaced runways on the west side of the site, and the "midfield" alternative with widely spaced runways with a terminal in the middle. While CCDOA is still examining both alternatives, it appears that the midfield alternative will be found to be operationally preferable and anticipates that this will become the sponsor's preferred alternative. While the facilities requirements for both alternatives are largely identical, any differences are noted in the discussion below.

[138] CCDOA, Forecast of the Distribution of Aircraft Operations Between McCarran International Airport (LAS) and the proposed Ivanpah Valley Airport (IVP) (2006).

4.4.1 Airfield Facilities

4.4.1.1 Design Criteria

Design criteria must be identified and applied to properly and consistently plan future facilities. Airport design criteria are specified by the airport reference code that consists of two components. The first component is the aircraft approach category. This component is related to the approach speed of aircraft and provides information on the operational requirements of aircraft projected to use the airport. The second component is the airplane design group. This component is related to the wingspan of the aircraft and provides information regarding the physical characteristics of aircraft projected to use the airport. **Table 4-1** provides a listing of the approach categories and design groups.

TABLE 4-1
AIRPORT DESIGN CRITERIA

Airport Approach Category	
Category	**Approach Speed**
A	Less than 91 Knots
B	91 to 120 Knots
C	121 to 140 Knots
D	141 to 165 Knots
E	166 Knots or Greater
Airport Design Group	
Group	**Wing Span**
I	Up To 48 Feet
II	49 to 78 Feet
III	79 to 117 Feet
IV	118 to 170 Feet
V	171 to 213 Feet
VI	214 Feet or Greater

Source: FAA Advisory Circular 150/5300-13, Airport Design.

The forecast of aviation activity for the new airport indicates that the most likely type of initial aircraft operations at the facilities will be long-haul international and charter operations using a variety of large aircraft including the 747-400, 777, A-340, and A-330. These aircraft have airport reference codes up to and including D-V and are projected to use the airport on a regular basis (i.e., more than 500 annual operations). Aircraft exceeding D-V, such as the A-380 and the proposed 747-800, which are in the D-VI airport reference code, are also expected to use the airport on occasion. These aircraft will likely exceed 500 annual operations as a group, but are unlikely to exceed 500 annual operations individually, at least during the early years of the facility's operation. On the basis of these projections, the airport is proposed to be designed to airport reference code D-VI.

4.4.1.2 Geometric Standards

FAA design standards specify the required geometric standards to ensure that aircraft can efficiently and safely operate on airport runways and taxiways without risk of collision with other aircraft or fixed objects. Geometric standards address issues such as the required separation between runways, between runways and taxiways, and between taxiways and adjoining taxiways. **Table 4-2** presents the geometric standards for Design Group V and VI aircraft.

TABLE 4-2
GEOMETRIC STANDARDS FOR
DESIGN GROUP V AND VI AIRCRAFT (IN FEET)

Item	Design Group V	Design Group VI
Runway Centerline to Parallel Runway Centerline	1,200	1,200
Runway Centerline to Parallel Taxiway Centerline	450 / 550	600
Taxiway Centerline to Parallel Taxiway Centerline	267	324
Taxilane Centerline to Parallel Taxilane Centerline	245	298

Source: FAA Advisory Circular 150/5300-13, Airport Design.

The required separation between parallel runways for a system designed to accommodate Design Group V and VI aircraft is 1,200 feet for simultaneous Visual Flight Rule (VFR) operations. The runways in the west-airfield alternative have a separation of 1,200 feet. By contrast, the runways in the midfield alternative have a separation of 4,800 feet. For both alternatives, runway centerline to taxiway centerline separations are 600 feet in accordance with Design Group VI standards. Also for both alternatives, the separation distances from taxiway centerline to taxiway, and the distances from taxiway centerline to taxilane centerlines are 324 feet and 298 feet, respectively. These separations will accommodate the Design Group VI aircraft.

4.4.1.3 Number of Runways

The forecast of aircraft operations predicts approximately 42,000 annual aircraft operations at the facility's opening in the year 2017 and approximately 172,000 annual operations by the year 2025. Although a single runway could accommodate this level of activity with minimal delay, a second runway will be needed on a capacity basis during the ensuing years when annual aircraft operations exceed 200,000. In addition, a second runway is needed to ensure that service is not interrupted during airfield emergencies or airfield repair. This is an important feature for airlines that would likely be serving the airport. Therefore, the airfield for both alternatives is initially planned as a two-runway system.

4.4.1.4 Runway Orientation and Location

Both alternatives contemplate a parallel two-runway system with an orientation of approximately 010/190 degrees. This orientation would situate the runways parallel to the mountain ranges east and west of the site and also fits within a corridor established between Interstate 15 and the Union Pacific Railroad. This orientation also maximizes wind coverage. **Table 4-3** provides the wind coverage for the proposed runway orientation.

TABLE 4-3
ALL-WEATHER WIND COVERAGE

Crosswind Component	Wind Coverage	
	Runway 18L/36R	Runway 18R/36L
10.5 Knots	96.96%	96.96%
	96.96%	
13 Knots	98.89%	98.89%
	98.89%	
16 Knots	99.73%	99.73%
	99.73%	
20 Knots	99.98%	99.98%
	99.98%	

Notes: Station: Ivanpah Valley Weather Station.
Period Record: January 1, 2001 to March 4, 2004 and April 10, 2004 to October 5, 2005.
Number of Observations: 80,212 half hour observations.
Source: Clark County Department of Aviation.

In the west-airfield alternative, both runways would be located on the west of the site, near I-15, which would permit maximum flexibility for the design of passenger terminal facilities. The separation between the two runways for this alternative would be 1,200 feet to meet Aircraft Design Group VI standards and the requirements for simultaneous VFR operations. However, the runway system would be treated as a single runway when wake turbulence is a factor, because the separation is less than 2,500 feet. Any additional future runway would be located on the east side of the site near the existing Union Pacific Railroad.

For the midfield alternative, the west runway would remain in nearly the same location as the west-airfield alternative, but the east runway would move to just west of the Union Pacific Railroad. The resulting separation between the two runways would be 4,800 feet. This additional separation would likely eliminate wake turbulence dependencies between the two runways. FAA standards require a minimum of 2,500 feet between runway centerlines in order for each runway to be operated independently when wake turbulence is a factor. In addition, the increased separation between the runways in the midfield alternative would increase the airfield capacity, thereby delaying the need for additional runways. According to FAA, parallel runway systems having a separation of more than 4,300 feet have an annual capacity of up to 370,000

operations as compared to parallel runway systems with a separation of only 1,200 feet, which have an annual capacity of only 355,000 operations.[139]

For both alternatives, the runway designations considering magnetic declination would be 18R/36L and 18L/36R.

4.4.1.5 Runway Length

Runway length requirements are dependent on the following parameters:[140]

Aircraft:	747-400 with PW4056 engines
Temperature:	104º F (mean maximum hottest month – July)
Runway Slope:	0, 0.6 and 1.2 percent
Length of Haul:	5,500 nautical miles
Takeoff Weights:	760,000 and 820,000 pounds

Table 4-4 presents the results of CCDOA's preliminary analysis.

TABLE 4-4
RUNWAY LENGTH REQUIREMENTS (IN FEET)

Takeoff Weights (lbs.)	Potential Runway Slopes				
	1.2	0.6	0.0	-0.6	-1.2
760,000	13,000	12,300	11,900	11,500	11,300
820,000	15,600	14,800	14,100	13,700	13,400

Source: Boeing.

The airport site is partially located in a 100-year floodplain associated with a dry lake bed (Roach Lake). Drainage studies that are currently underway by CCDOA will determine airfield design considerations to minimize flooding potential. Consequently, the actual elevations of the proposed runway ends are not known at this time; however, it is known that the topography at the proposed site slopes upward to the north as the distance from the dry lake bed increases. Therefore, the runways are likely to have a positive gradient for takeoffs to the north and a negative gradient for takeoffs to the south. A topography review indicates that a gradient greater than 0.6 is unlikely. Therefore, a runway length of 14,800 feet appears to be justified using a takeoff weight of 820,000 pounds. However, hauls longer than 5,500 nautical miles and takeoff weights greater than 820,000 pounds are possible in the future. Given these factors and the fact that runway slopes are not yet known, a runway length of 15,000 feet appears justified on the basis of the Boeing data. The secondary runway is planned for a length of 12,000 feet which will accommodate the majority of other aircraft operations.

139 FAA AC 150.5060-5 ("Airport Capacity and Delay").
140 CH2MHill, Conceptual Airport Layout Play Study for Ivanpah Valley Airport (2002).

4.4.1.6 Runway Width

For both alternatives, Runway 18R/36L is planned at a width of 150 feet in accordance with Design Group V standards. Runway 18L/36R is planned at a width of 200 feet in accordance with Design Group VI standards.

4.4.1.7 Runway Strength

Runway strength is based upon the critical aircraft expected to use the runways. Consequently, the strength of Runway 18R/36L pavements should be sufficient to accommodate Design Group VI aircraft such as the A-380 and the proposed 747-800. The strength of Runway 18L/36R pavements should be sufficient to accommodate Design Group V aircraft such as the 747-400. **Table 4-5** presents the proposed pavement strengths.

TABLE 4-5
PROPOSED RUNWAY PAVEMENT STRENGTHS

Aircraft Landing Gear Configuration	Weight Bearing Capacity (in Pounds)	
	Runway 18L/36R	Runway 18R/36L
Single-Wheel	75,000	75,000
Dual-Wheel	210,000	210,000
Dual-Wheel Tandem	514,000	514,000
Double Dual-Wheel Tandem	1,240,000	913,000

Source: URS Corporation, 2006.

4.4.1.8 Taxiways

The west-airfield alternative provides for a dual parallel taxiway system on the east side of Runway 18L/36R. This system would allow crossing traffic flows and unrestricted taxiing to all portions of the proposed passenger terminal. A single parallel system on the east side of Runway 18R/36L would accommodate aircraft taxiing to and from the west runway. Taxiways associated with Runway 18L/36R would be designed to Design Group VI standards, while those associated with Runway 18R/36L would be designed to Design Group V standards.

In the midfield alternative, the airfield would have a runway centerline-to-runway centerline separation of approximately 4,800'. The taxiway system would provide unrestricted access from either runway to the midfield terminal area. The taxiways associated with Runway 18L/36R would be designed to Group VI standards and Runway 18R/36L designed to Group V. Relevant taxiway design standards associated with Design Group V and VI are presented in **Table 4-6**.

TABLE 4-6
TAXIWAY DESIGN STANDARDS
(DISTANCES IN FEET)

Item	Design Group V	Design Group VI
Width	75	100
Taxiway Edge Safety Margin	15	20
Taxiway Shoulder Width	35	40
Taxiway Safety Area	214	262
Taxiway Object Free Area Width	320	386
Taxilane Object Free Area Width	276	334

Source: FAA Advisory Circular 150/5300-13, Airport Design.

4.4.1.9 Navigational Aids

A full range of electronic and visual navigational aids are proposed for the airport and are described in the following paragraphs. The navigational aid requirements for both airport layout alternatives are identical.

It is not known whether a traditional instrument landing system (ILS) will still be the primary means of providing precision approaches at airports at the time the new airport opens or whether FAA will have transitioned to a satellite-based navigation system such as the Global Positioning System (GPS) with augmentation such as the Wide Area Augmentation System (WAAS) or Local Area Augmentation System (LAAS). Consequently, it is possible that the requirements for electronic navigational aids may change between now and the time the new airport is constructed. Requirements for new electronic navigation aids associated with a satellite-based navigation system will be addressed when appropriate standards are established and published by the FAA. Therefore, this section describes the requirements for traditional electronic navigational aids.

Electronic navigation aids would include instrument landing systems on all runway ends. Glide slope antennas would be located on all runway ends. It is anticipated that the glide slopes for both runways would be located on the west side of the runways to minimize the amount of taxiway queuing area subject to critical area restrictions. Localizer antennas are proposed just beyond the end of each runway safety area.

A Terminal Very-High Frequency Omni-directional Range Station (TVOR) is proposed at the north end of the site. This facility would assist with the development of instrument approach procedures to the new airport. However, the exact location of the facility would be subject to FAA requirements and local site conditions. This navigational aid requires a clearance radius of 1,000 feet.

An Airport Surveillance Radar (ASR) system is proposed for the south end of the airport site to provide radar coverage of aircraft operations into and out of the new airport. This facility requires a clearance radius of 1,500 feet.

Visual navigational aids would include Precision Approach Path Indicators (PAPI) on all runway ends. These would provide approach slope guidance to pilots without ILS capability and aircraft not conducting instrument approaches.

A rotating beacon is proposed to be located on the west side of the airport near the airport's perimeter road. The proposed location is away from the runway approaches and should not interfere with air traffic control nor should it interfere with any future airport facilities for either the west-airfield or the midfield alternative.

Wind cones are proposed for all runway ends and are sited in accordance with guidance specified in FAA Advisory Circular 150/5340-30A, Design and Installation Details for Airport Visual Aids. This guidance specifies that wind cones are optimally sited at a location 1,000 feet from the runway threshold and 250 feet from the runway centerline.

4.4.1.10 Approach Lighting Systems

Medium Intensity Approach Lighting Systems with Runway Alignment Indicator Lights (MALSR) are proposed for all runway ends. This type of approach lighting system is standard for Category 1 Instrument Landing Systems (ILS) and would enable approach visibility minimums as low as 200-foot ceilings and 1/2 mile of horizontal visibility provided that all other requirements are also met.

4.4.1.11 Air Traffic Control

An air traffic control tower is proposed in the midfield area for both alternatives. The tower is proposed in this location in order to meet the requirements for object detection and recognition specified in FAA Order 6480, Airport Traffic Control Tower Siting Process. Sites previously considered in the vicinity of the airport's support facilities, south of the passenger terminal area, cannot meet these criteria due to the long distance to the north end of Runway 18L/36R. Access to the air traffic control tower would be via the passenger terminal concourse at ultimate buildout for both alternatives (although for the west-airfield, initial access would be via roadway).

4.4.2 Terminal Facilities

4.4.2.1 Passenger Terminal

The basis of the terminal layout for both airfield alternatives is predicated on a landside terminal processor with an attached airside concourse as the initial terminal development phase, followed

by the development of airside satellites that would be inter-connected by an underground Automated People Mover (APM). For design phase one (DP-1), it is envisioned that the terminal complex would be comprised of the initial terminal development phase plus the first airside satellite to the south. The remaining satellites are envisioned beyond the DP-1 or 2025 time frame. For the west-airfield alternative, the terminal complex would be located east of the airfield, while the for the midfield alternative, the terminal would be located between the parallel runways.

4.4.2.2 Gates

CCDOA employs a metric of 450,000 annual passengers per gate to estimate their constructed gate requirements. Therefore, both airport alternatives would be planned according to the following minimum gate requirements:

Period	**Gates**
Opening Day 2017	12 gates
Opening Day +5 years	30 gates
DP-1	42 gates

For both alternatives, the initial terminal development would have approximately 26 gates, which would closely match the requirement for 2022 (*i.e.*, Opening Day plus 5). Depending on the gauge of aircraft in use during a particular period of the day, additional aircraft could be accommodated. For DP-1 (2025), this alternative would provide 46 gates through the addition of the first satellite. This would exceed the DP-1 requirement.

In addition to contact gates, CCDOA has historically maintained a significant number of remote gates for aircraft parked overnight. The ratio of remote gates to contact gates has historically been in the range of 60 percent. For DP-1, this would translate into a requirement for 26 remote gates. However, the demand for overnight parking has recently increased and is now approaching 1 for 1 (*i.e.*, one remote gate for each contact gate). Both airport alternatives provide space for approximately 40 remote gates in DP-1; thus achieving the 1 for 1 ratio.

4.4.2.3 Terminal Space Requirements

As depicted in **Table 4-7**, it is estimated that the new airport will require approximately 1.4 million square feet of terminal area for opening day plus five years (2022). For DP-1 (2025), the requirement increases to a total of 2.1 million square feet.

Both the midfield and west airfield alternatives would be planned to include approximately 1.7 million square feet for opening day, and an additional 2.1 million square feet with the addition of an airside satellite for DP-1. CCDOA assumes that the landside portion of the terminal for both alternatives would be 2½ levels, which include a separate departures and arrivals level, an underground APM station in the basement, and 1½ levels for the attached airside concourse. The

partial second level at airside would be for the provision of a sterile corridor for international arriving passengers from the international gates to the Federal Inspection Service (FIS).

For both alternatives, the terminal requirements provide for approximately 231 square feet per peak hour passenger on opening day and 250 square feet per peak hour passenger for DP-1. Based on average space utilization for terminal development and in comparison to industry standards, these estimated requirements appear reasonable at this level of planning subject to further analysis.

4.4.2.4 Central Plant

For both airport layout alternatives, an area for a central plant has been reserved northeast of the passenger terminal. This location is optimal because it is close to the passenger terminal, yet it would not interfere with expansion of the terminal for either alternative.

4.4.3 Surface Transportation

4.4.3.1 Access Roadways

There appears to be sufficient space in the existing right-of-way along the I-15 corridor to permit the construction of dedicated airport lanes. While CCDOA is still examining surface transportation options and is still conducting relevant studies, dedicated lanes appear to be the preferred mode for providing transportation access to the new airport.

Three primary access roadways are proposed for the new airport. The primary access to the passenger terminal and the rental car facilities would be via a full interchange on Interstate 15 near the north end of the site. As currently envisioned, the proposed interchange would allow for airport dedicated lanes in the median of Interstate 15 to flyover the northbound lanes of Interstate 15 and provide the main means of access to and from the airport. For vehicles not traveling on the airport dedicated lanes, access would also provided from the northbound and southbound lanes of Interstate 15.

A second means of access is proposed via an access road along the west side of the Union Pacific Railroad right-of-way. This road would connect Jean and Primm and would provide emergency access to the passenger terminal in the event of a temporary closure along the stretch of Interstate 15 between those two sites.

A third access point for cargo, general aviation, and support facilities would be provided via an access road that connects to an interchange with Interstate 15 at the south end of the site. The access road leading to the interchange would also connect to the secondary access road along the west side of the Union Pacific Railroad.

TABLE 4-7
PASSENGER TERMINAL BUILDING REQUIREMENTS (SQUARE FEET)

Functional Area	Opening Day (2017)	DP-1
Federal Inspection Service		
Immigration and Naturalization	23,200	23,200
Public Health Service	1,100	1,100
Animal & Plant Inspection	5,500	5,500
Customs Service	17,100	17,100
Fish and Wildlife	1,000	1,000
International Baggage Claim	50,000	50,000
Subtotal	**97,900**	**97,900**
Public Space		
Ticketing Lobby	12,600	20,800
Baggage Claim Lobby	12,600	25,200
Main Terminal Circulation	132,000	214,600
Concourse Circulation	102,400	168,400
Subtotal	**259,600**	**429,000**
Security Screening		
Baggage Security Screening	44,000	44,000
Passenger Security Screening	42,000	42,000
Passenger Queue	21,000	21,000
Subtotal	**107,000**	**107,000**
Airline Space		
Ticketing Lobby	2,850	4,300
Airline Ticket Office	8,000	13,000
Baggage Claim	27,750	54,100
Inbound Baggage Handling	26,400	52,800
Outbound Baggage Handling	87,700	144,000
Baggage Service Offices	5,000	8,000
Holdrooms	78,000	132,000
Airline Operations	5,500	8,800
Other Airline Space	28,400	44,800
Subtotal	**269,600**	**461,800**
Concessions and Gaming		
Concessions and	84,000	176,400
Gaming	51,000	79,600
Subtotal	**135,000**	**256,000**
Passenger Services		
Information	3,400	5,300
Rest Rooms	9,200	14,700
Medical	800	1,400
Miscellaneous	3,900	4,800
Circulation	3,500	5,300
Subtotal	**20,800**	**31,500**

Functional Area	Opening Day (2017)	DP-1
Department of Aviation		
Administration	14,200	14,200
Planning & Construction	3,600	4,800
Landside Operations	4,200	5,500
Airside Operations	8,000	9,900
Facilities & Terminal Operations	9,900	13,800
Other Agencies	3,990	4,820
Subtotal	**43,890**	**53,020**
Building Support		
Automated Transit System	172,100	172,100
Unassigned Circulation Space	11,720	19,150
Building Support Space	82,800	141,900
Building Structure	188,500	332,500
Subtotal	**455,120**	**665,650**
Estimated Total Terminal Gross Area	**1,388,910**	**2,101,870**

Source: URS Corporation, 2004.

4.4.3.2 Terminal Curb

While it is difficult to predict how the new facility will operate from a surface transportation perspective, the worst case scenario (*i.e.*, "reduced taxi" scenario) suggests that a total of 2,420 linear feet of curb required for opening day and a total of 3,810 linear feet by 2025. The preliminary plans for both alternatives would provide approximately 1,400 linear feet of curb in front of the terminal. Based on a two-level terminal and the use of "island curbs" for passenger drop-off or pick-up, the terminal area would have adequate curb frontage to meet future requirements. **Table 4-8** delineates the curb frontage requirements.

TABLE 4-8
TERMINAL CURB FRONTAGE REQUIREMENTS

Category	Opening Day - 2017 (ft)	DP-1 (ft)
Arrivals		
Taxis	250	400
Shuttles/Limos	455	700
Rental Car Buses	315	495
Private Autos	300	500
Total Arrivals	1,320	2,095
Departures		
Taxis	200	300
Shuttles/Limos	385	595
Rental Car Buses	315	495
Private Autos	200	325
Total Departures	1,100	1,715
Total Curb	**2,420**	**3,810**

Source: CH2M Hill, January 2002.

4.4.3.3 Public Parking

The number of projected public parking spaces is listed in **Table 4-9**. These parking requirements were established using statistics and ratios derived from LAS and will require further refinement as the planning process advances. A dedicated area for taxi stands would also be provided for both airport layout alternatives. In addition, CCDOA expects that charter buses will comprise a significant portion of the surface transportation to the airport. Therefore, both airport layout alternatives provide for a facility dedicated to parking and passenger access.

TABLE 4-9
AUTOMOBILE PARKING REQUIREMENTS

	Opening Day (2017)	DP-1
Auto Parking		
Short-Term Spaces	1,300	2,200
Long-term Spaces	2,700	4,300
Employee Spaces	1,300	2,200
Total Spaces	**5,300**	**8,700**
Vehicle Holding Area		
Taxi Cabs	100	175
Vans / Limos	60	90
Charter Bus	20	30

Source: CH2M Hill, January 2002.

4.4.3.4 Employee Parking

For both airport layout alternatives, employee parking would be located north of the passenger terminal complex in an area accessed via an interchange from the airport's main access road. This area provides ample space for future expansion without impacting other facilities.

In the short-term, it is likely that employee parking could be accommodated next to public parking in the center of the terminal roadway loop in both the west airfield and midfield alternatives. However, as public parking requirements increase, a dedicated space for employee parking will be required for both alternatives. The number of spaces for employee parking is provided in the preceding section.

4.4.3.5 Rental Car Parking

For both airport layout alternatives, rental car facilities would be located north of the passenger terminal complex. Both alternatives provide sufficient space for a customer service building, a vehicle ready and return garage, and vehicle storage and service facilities. For both alternatives, the rental car facilities would be accessible via an interchange along the main airport access road. The demand for rental car parking was originally developed in the Conceptual Airport Layout Plan (CALP) Study for Ivanpah Valley Airport, prepared by CH2M Hill in January 2002. The

projections were further evaluated in the Conceptual Airport Layout Plan Validation Report, prepared by URS in May 2005 and are presented in **Table 4-10**.

TABLE 4-10
RENTAL CAR REQUIREMENTS

	Opening Day +5	DP-1
Fleet Size	5,000	8,500
Ready/Return Spaces	1,000	1,700
Storage Spaces	1,000	1,700
Total Spaces	2,000	3,400

Source: CH2M Hill, January 2002.

4.4.4 Cargo Facilities

Two types of cargo facilities will be needed at the new airport. Dedicated cargo buildings along with aircraft apron, truck docks, and employee parking will be needed for all-cargo carriers. In addition, warehouse facilities with direct access to the passenger terminals will be needed for belly freight carried on passenger flights.

4.4.4.1 All-Cargo Facilities

The forecast of aircraft operations indicates that some portion of all-cargo activity at LAS may transfer to the new airport depending upon facility and leasing decisions by the CCDOA. Therefore, the new airport should be capable of accommodating two cargo buildings and up to 10 Design Group V aircraft. Suitable locations for these buildings for both the west airfield and the midfield alternative are depicted on **Figures 4-1** and **4-2**. As depicted in these preliminary plans, the buildings are currently planned to have a width of 120 feet and a length of 1,200 feet. This provides 144,000 square feet of space in each building for a total of 288,000 square feet. This amount of space substantially exceeds the short-term projections of all-cargo demand as summarized in **Table 4-11**.

TABLE 4-11
ALL-CARGO FACILITY REQUIREMENTS
(AREA IN SQUARE FEET)

Item	Year		
	2017	2020	2025
All-Cargo Flights	1,976	2,288	2,600
Avg. Pounds/Flight	22,000	23,000	24,900
Tons of Cargo	21,736	26,312	32,370
Floor Space	43,472	52,624	64,740

Source: URS Corporation, 2006.
Note: Floor space requirement is calculated on the basis of 2 square feet per ton.

It should be noted that the above space calculations are based on values from LAS. Should the average size of the freighters at the new airport be larger, the space requirements indicated in **Table 4-11** would increase accordingly.

4.4.4.2 Belly Freight

Facilities for accommodating belly-freight will also be needed. The preliminary plans for both alternatives reserve space for belly freight buildings at the northeast corner of the support facilities area. For both alternatives, this area is close to the passenger terminal apron and can be accessed from the airside via a secure service road. Landside access would be via an access road that will connect to Interstate 15. CCDOA plans to construct one belly freight building initially and is reserving room for a second building as demand grows.

4.4.5 General Aviation Facilities

The demand for general aviation facilities is speculative. It is unlikely that any demand from LAS will transfer to the new airport. It is more likely that general aviation activity at LAS will continue to shift to other existing general aviation facilities near Las Vegas that are closer to the city center. General aviation activity at the new airport may initially consist of training activity that is attracted to the airport's low level of delay and good facilities. While some level of general aviation activity will likely occur, its levels are highly speculative. Therefore, the plans for both airport layout alternatives reserve land for a general aviation area that could support a fixed base operator and some hangar development. For both alternatives, this area is located south of the proposed all-cargo facility at the south end of the airfield.

4.4.6 Aircraft Rescue and Firefighting Facilities

Because of the length of the airfield (for both alternatives) and the potential for response time requirements to change between now and the time the airport is constructed, CCDOA has concluded that it is appropriate to reserve two potential locations for Aircraft Rescue and Firefighting (ARFF) stations. The first ARFF station would be west of the passenger terminal. The second location is at the northwest corner of the support facilities. These locations are depicted on **Figures 4-1** and **4-2**.

4.4.7 Support Facilities

A wide range of support facilities will be needed to operate the new airport. These facilities would be located at the south end of the site and would be accessible by an interchange with I-15 for both the west-airfield and the midfield alternatives. Required facilities include:

- A materials handling facility for the screening of delivered items.

- A site for airline maintenance. This building would provide space for airline maintenance of ground support vehicles and equipment such as baggage tugs and carts, aircraft tow tugs, unit load devices, and miscellaneous airline vehicles.
- A postal facility to accommodate incoming and outgoing mail.
- A flight kitchen.
- An aircraft waste station for the disposal of waste from aircraft lavatories.
- A waste transfer station for trash and refuse removal.
- A treatment facility for stormwater runoff as well as sanitary sewage. This facility would provide for the ability to treat water to applicable Federal and State water standards before release or reuse of treated water for non-potable purposes.
- A fuel farm. From a safety perspective, the fuel farm should be located remotely from all passenger handling facilities and most support facilities. From a convenience perspective, the fuel farm should be located in proximity to the current fuel pipeline that runs parallel to the Union Pacific Railroad.

4.5 ON-AIRPORT LAND USE PLAN

Given the large size of the site, the majority of airport land will be reserved for planned and future airport development. A significant portion of that land will be used for water retention purposes. The next largest use of land will be for airfield operations and will include runways, taxiways and their associated clearances including runway protection zones. Passenger terminal facilities would comprise the next largest use of land. Remaining land uses include parking, ground transportation, support facilities cargo facilities, general aviation and navigational facilities. **Table 4-12** indicates the approximate number of acres devoted to each land use.

TABLE 4-12
AIRPORT LAND USE

Land Use	Acres	Percent of Land
Airfield	1,582	27%
Terminal Facilities	545	9%
Cargo Facilities	54	1%
Support Facilities	132	2%
Parking	152	3%
General Aviation	45	1%
Ground Transportation	70	1%
Navigational Aids	235	4%
Reserved for Future Development	3,045	52%
Total	5,860	100%

Source: URS Corporation, 2006.

FIGURE 4-1
WEST AIRFIELD ALTERNATIVE

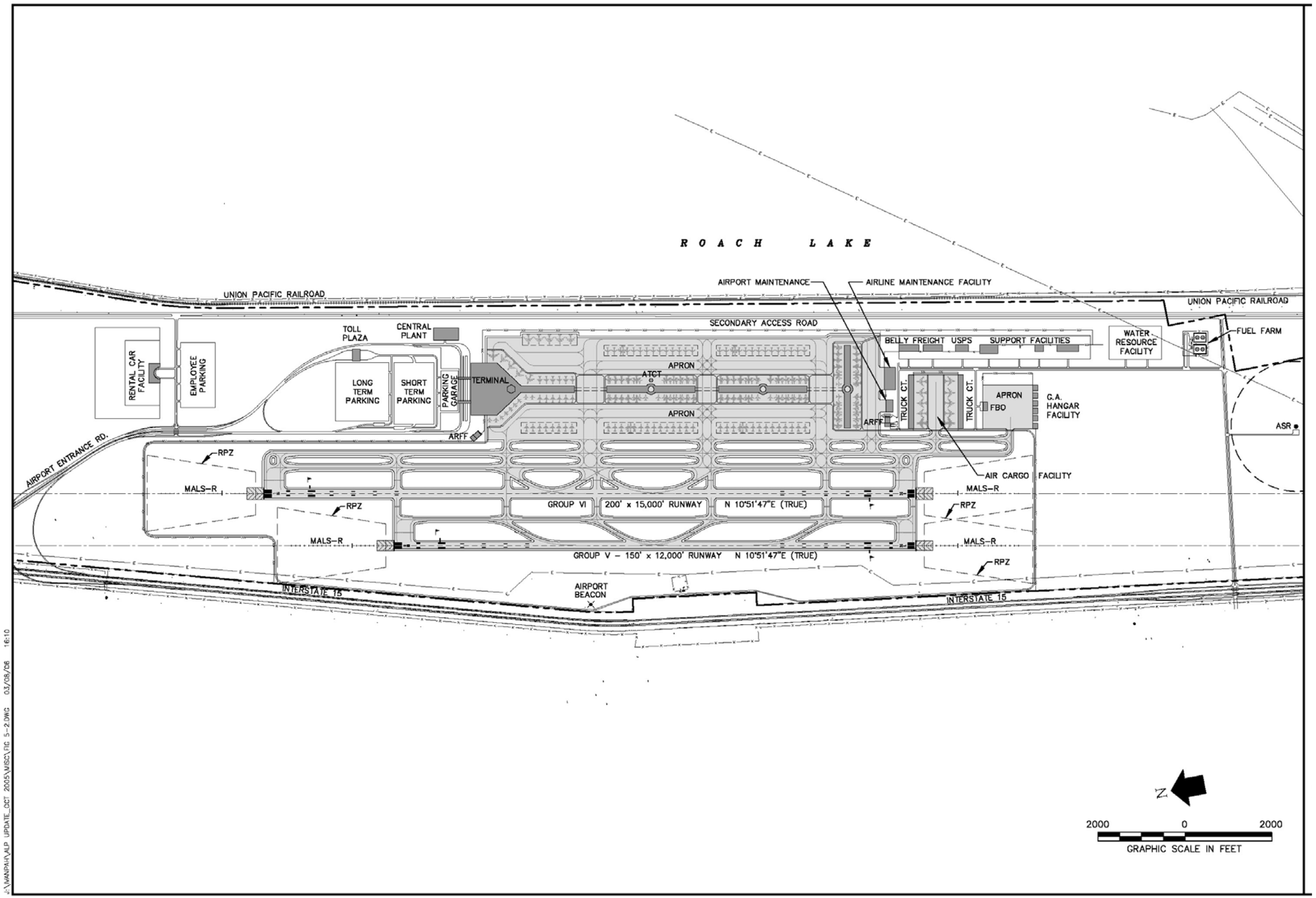
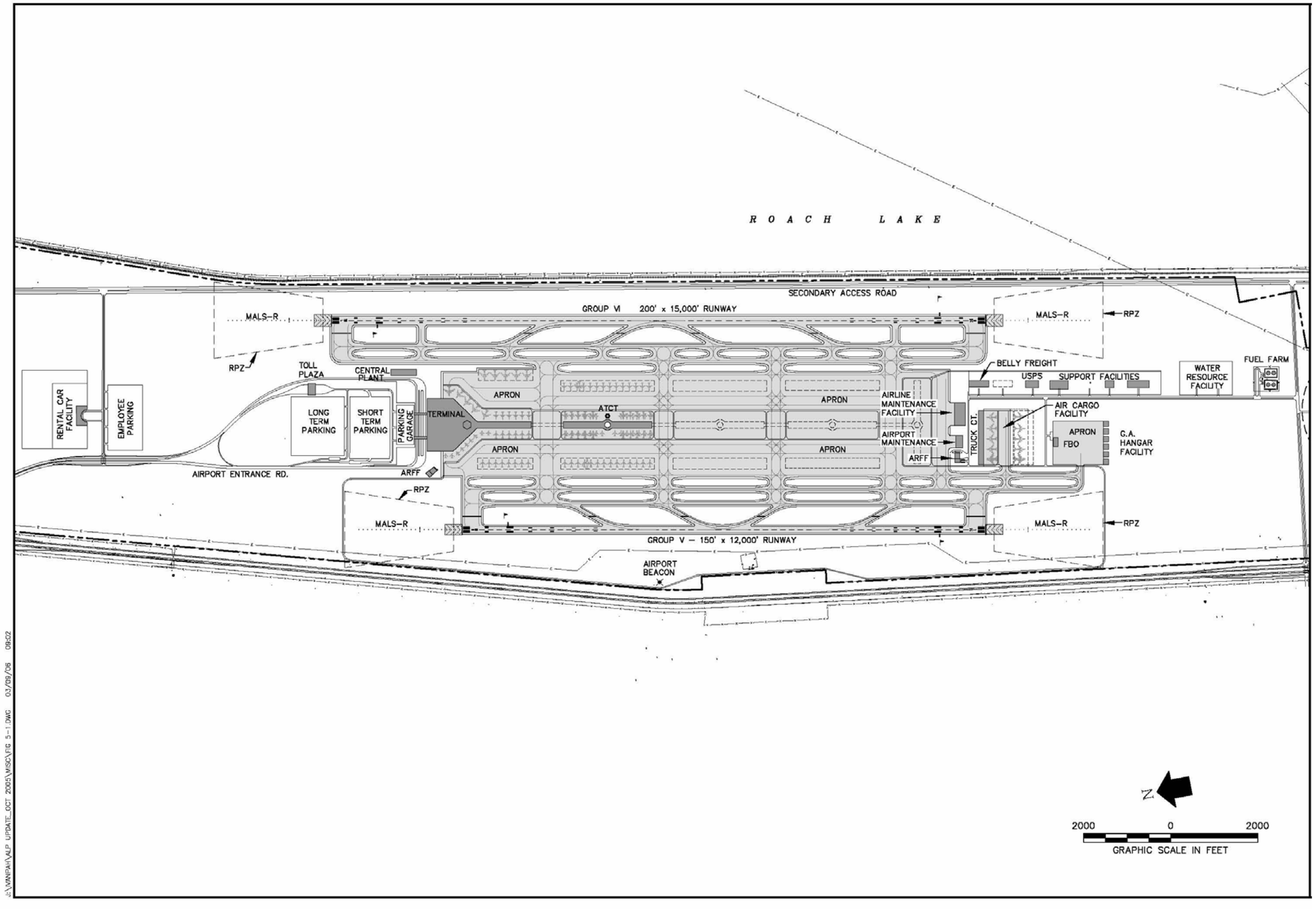


FIGURE 4-2
MIDFIELD ALTERNATIVE



5 FEDERAL ROLE IN THE PROPOSED ACTION

5.1 COMPARISON TO FEDERAL OBJECTIVES

This Project Definition and Justification is the articulation by CCDOA – the sponsor of the Proposed Action – of the objective need for and CCDOA's own purposes for the Proposed Action. FAA and BLM are preparing a federal environmental impact statement (EIS) on the Proposed Action. One of the key sections of the EIS is the statement of purpose and need for the Proposed Action. The intent of the following discussion is to provide the reader with a comparison between the sponsor's and federal requirements and to ascertain the degree to which County goals and objectives dovetail with the federal purposes and needs for this project. Under federal law, CCDOA's objectives and goals, as set forth in this document, are entitled to substantial weight from the federal agencies in the preparation of the EIS for the Ivanpah Project.[141]

The following discussion identifies the *likely* federal objectives that CCDOA believes that the joint lead agencies are likely to identify as the purpose and need for the project.

5.1.1 Expected FAA Purposes

FAA is charged with implementation of federal policies under its statutory authorities. It is within the framework of the Airport and Airways Improvement Act of 1982, 49 U.S.C. §§ 47101 – 47131 (as amended) (AAIA), therefore, that the FAA is being asked to approve CCDOA's proposal to construct a new supplemental commercial service airport in the Ivanpah Valley. Among other things, the AAIA provides that it is the policy of the United States:

- That the safe operation of the airport and airway system is the highest aviation priority.[142]

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[141] *See* FAA Order 5050.4B at §§ 706(b), 706(c), 908(a)(1), and 911 (noting the critical role of the Sponsor in identifying and describing the proposed action in the NEPA process). In fact, many federal courts have articulated the principle that federal agencies that are asked to approve a non-federal project – like the Proposed Action – are required to give substantial weight to the objectives of the project sponsor. *See, e.g., Citizens Against Burlington v. Busey*, 938 F.2d 190 (D.C. Cir. 1991); *Citizens' Comm. To Save Our Canyons v. U.S. Forest Service*, 297 F.3d 1012, 1030 (10th Cir. 2002); *Alliance for Legal Action v. FAA*, 69 Fed. Appx. 617, 622 (4th Cir. 2003); *see also, Residents in Protest – I-35E v. Dole*, 583 F. Supp. 653, 660 (D. Minn. 1984); 52 Fed. Reg. 22517, 22521 (June 12, 1987) (CEQ review of Army Corps of Engineers' NEPA Regulations) ("a reasonable evaluation of the proposed action and alternatives must include a thorough understanding of the applicant's purpose and need"). Toward that end, a key purpose of this report is to provide detail for the FAA and BLM to assist those agencies in understanding the objectives of the CCDOA and to understand the facts underlying the need for the Proposed Action.

[142] *See also* 49 U.S.C. 40101. According to 49 U.S.C. § 40101(d)(1), federal policy includes "assigning, maintaining, and enhancing safety and security as the highest priorities in air commerce." Another important matter "in the public interest" is "preventing deterioration in established safety procedures." 49 U.S.C. 40101(a)(3).

- That aviation facilities be constructed and operated to minimize current and projected noise impact on nearby communities.

- To encourage the development of transportation systems … that will serve the States and local communities efficiently and effectively.

- That airport construction and improvement projects that increase the capacity of facilities to accommodate passenger and cargo traffic be undertaken to the maximum feasible extent so that safety and efficiency increase and delays decrease.

- That all forms of transportation, including aviation and other transportation systems of the future, will be full partners in the effort to reduce energy consumption and air pollution while promoting economic development.

- The United States transportation infrastructure must be reshaped to provide the economic underpinnings for the United States to compete in the 21st century global economy.

- It is in the public interest to recognize the effects of airport capacity expansion projects on aircraft noise. Efforts to increase capacity through any means can have an impact on surrounding communities. Non-compatible land uses around airports must be reduced and efforts to mitigate noise must be given a high priority.[143]

The FAA, through its own planning process, has refined and expanded the role of airports as components of the National Aviation System (NAS). The agency has clearly recognized the need to plan for a system of airports to meet demand for aviation facilities as well as to address a number of national needs and priorities. Development of aviation facilities whether at the Ivanpah site or elsewhere in the Southern Nevada region, needs to be evaluated on the criteria set forth in the National Plan of Integrated Airport Systems (NPIAS). The NPIAS provides standardized criteria and procedures by which to evaluate airport roles as well as their effectiveness and eligibility for federal airport grants on a national level. The nine goals set forth in the NPIAS are summarized below:

- Airports should be safe and efficient; located at optimum sites; and developed and maintained to appropriate standards.

- Airports should be affordable to users and government.

- Airports should be flexible and expandable.

- Airports should be permanent, with assurances that they will remain open for aeronautical use over the long-term.

- Airports should be compatible with surrounding communities.

[143] 49 U.S.C. § 47101.

- Airports should be developed in concert with improvements in the air traffic control system.

- The airport system should support national objectives for defense and emergency readiness.

- The airport system should help air transportation contribute to a productive national economy and international competitiveness.

- The airport system should be extensive, providing as many persons as possible access to air transportation, typically not more than 20 miles travel to the nearest NPIAS airport.

Based on these directives, CCDOA has identified four critical FAA-related purposes for the Proposed Action that are likely to form the basis for the statement of purpose and need in the EIS:

- **Address aviation demand for the Southern Nevada air service area.** FAA has specifically identified LAS as one of the airports that will run out of capacity by 2020.[144] Because LAS is not a traditional hubbing airport, moreover, the need for supplemental capacity cannot be accommodated outside of the region. FAA must adopt measures to ensure development that will permit efficient service to the region and will ensure sufficient capacity in order to decrease delays. FAA must also ensure that any future development is consistent with the National Airspace System as a whole.

- **Ensure that the airport meets FAA design standards and is operated in a safe and efficient manner.** In particular, FAA needs to address the potential for conflicts with Nellis AFB or with other airspace constraints in the region. As stated in 49 U.S.C. § 40101(d)(4), federal responsibility includes "controlling the use of the navigable airspace and regulating civil and military operations in that airspace in the interest of the safety and efficiency of both of these operations."

- **Address the effects of the construction and operation of the proposed new airport related to noise and land use compatibility.** The FAA recognizes that it is in the public interest to address the effects of airport capacity projects on aircraft noise. Efforts to increase capacity through any means can affect surrounding communities. Incompatible land uses around airports must be reduced and efforts to mitigate noise in areas considered by the FAA to be exposed to significant aircraft noise must be given a high priority.

- **Contribute to the national economy**. The FAA must ensure that any change to the national airport system contributes to the national economy and enables the United States to compete in the 21st century global economy.

[144] FAA, *Capacity Needs in the National Airspace System: An Analysis of Airport and Metropolitan Area Demand and Operational Capacity in the Future* (2005).

5.1.2 Expected BLM Purposes

In enacting the Ivanpah Valley Airport Public Lands Transfer Act, Congress directed BLM to convey specific lands in the Ivanpah Valley for the purpose of developing an airport facility and related infrastructure.[145] Congress also directed that the Department of the Interior should be a joint lead agency with respect to initial planning and construction of the airport, and that all actions required under the National Environmental Policy Act (NEPA) with respect to initial planning and construction of the proposed airport should be completed and that all such actions should specifically address impacts on the purposes for which the Mojave National Preserve was created.[146]

Two years later, when enacting the Clark County Conservation of Public Land and Natural Resources Act of 2002, Congress directed BLM to transfer to Clark County additional land surrounding the Ivanpah Airport Site, which land is identified as the Ivanpah Airport noise compatibility area. The transfer is directed to take place, upon the request of the County, once the Ivanpah Valley Airport is approved according to the terms of the Lands Act.[147] In addition, the 2002 statute directed the Secretary of Interior, in consultation with the City of Henderson and Clark County, to establish a corridor on existing BLM land between the Las Vegas Valley and the proposed Ivanpah Airport for the placement of utilities and transportation.[148]

Based on these statutory directives, CCDOA has identified three key BLM-related purposes for the Proposed Action:

- **Convey and transfer certain lands in the Ivanpah Valley to Clark County.** Congress mandated the conveyance of lands in the Ivanpah Valley to Clark County for the purpose of constructing a new airport. It also directed the transfer of additional land (the noise compatibility buffer area) upon the request of the County once the construction of the Ivanpah Airport is approved according to the terms of the Lands Act. These commands are non-discretionary.

- **Establish a transportation and utility corridor.** Congress mandated the establishment of a transportation and utility corridor between the Las Vegas valley and the proposed Ivanpah Airport. This establishment is to take effect once the construction of the Ivanpah Valley Airport is approved according to the terms of the Lands Act. These commands are non-discretionary.

- **Ensure the appropriate protection of sensitive resources.** In response to concerns over the fact that the Lands Act relieved the Secretary of the Interior from the requirement that the land transfer be subject to certain public participation and land use planning requirements under the Federal Land Policy and Management Act (FLPMA),

[145] Pub. L 106-362 § 2(a).
[146] Pub. L 106-362 § 5.
[147] Pub. L 107-282 § 501.
[148] Pub. L 107-282 § 501(b).

Congress expressly directed that the Department of the Interior be a joint lead agency for the NEPA review in order to allow the Secretary of the Interior to be involved in the review of impacts to natural resources in the region, specifically the Mojave National Preserve.

5.1.3 Conclusions

The federal purposes for the Proposed Action complement but are consistent with CCDOA's objectives. The need for supplemental commercial capacity to address aviation capacity is readily apparent from the data presented in this report and in the source documents. FAA's recently published Aerospace Forecast predicts that the commercial aviation industry is expected to grow significantly,[149] and, as noted above, FAA has specifically identified LAS as one of the airports that will run out of capacity by 2020.[150] A recent GAO report addressing long-term capacity planning for the National Airspace System concluded that a key measure to addressing the problem is adding new capacity, "not by adding runways to existing capacity-constrained airports, but rather by building entirely new airports or using other nearby airports that have available capacity."[151] In addition, the impact to the local economy of not providing capacity for the forecasted demand would be significant. Furthermore, the United States Congress has expressly recognized that Clark County is "quickly exceeding capacity,"[152] that the Proposed Action is therefore "critically important to the future of the Las Vegas Valley, indeed the economy of [Nevada.]."[153] Moreover, Congress found that the Ivanpah Valley is "an ideal place to build a new airport" because of its proximity to Las Vegas, its favorable topography and orientation, its safe distance from constrained airspace, and its proximity to existing highway and railroad infrastructure[154] – all factors that dovetail neatly with FAA's statutory purposes.

5.2 THE REQUESTED FEDERAL ACTIONS

5.2.1 Major Federal Actions

The Proposed Action triggers six major actions that could significantly impact the quality of the human environment, and that therefore require federal environmental review under NEPA:

- FAA approval of the Airport Layout Plan (ALP) for the Ivanpah Airport and a determination of eligibility for federal funding.

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149 FAA, Aerospace Forecast Fiscal Years 2006 – 2007 (2006).

150 FAA, *Capacity Needs in the National Airspace System: An Analysis of Airport and Metropolitan Area Demand and Operational Capacity in the Future* (2005).

151 GAO, *National Airspace System: Long-Term Capacity Planning Needed Despite Recent Reduction in Flight Delays* (December 2001).

152 146 Cong. Rec. H765 (daily ed. Mar. 9, 2000) (statement of Rep. Hansen, sponsor of substitute amendment agreed to and passed by the House).

153 146 Cong. Rec. H766 (daily ed. Mar. 9, 2000) (statement of Rep. Gibbons, sponsor of the Lands Act in the House).

154 S. Rep. 106-471 at 2 (2000).

- FAA design, development, approval, and implementation of new and modified flight procedures, including airspace determinations, visual and instrument procedures, navigational aids, missed approach procedures, obstructions, and departure procedures.

- BLM transfer of the 17,000 acre noise compatibility area in accordance with the Lands Act.

- BLM establishment of the transportation and utility corridor from the Las Vegas valley to the proposed Ivanpah Airport.

- BLM approval of necessary rights-of-ways.

- FHWA approval of improvements and expansion to I-15 and necessary highway interchanges for the new airport.

5.2.2 Additional Permits, Approvals, and Determinations

The following is a preliminary list of additional federal, state and local permits, approvals and determinations that may be required for implementation of the Proposed Action. This list is preliminary only, and is subject to change once CCDOA conducts detailed planning, design, and engineering work for the Proposed Action.

TABLE 5-1
POTENTIAL PERMIT/APPROVAL REQUIREMENTS

		Permits/Approvals
1.	**Joint Lead Agencies (FAA/BLM)**	
	a.	EIS Record of Decision
	b.	Floodplain determination (and possible mitigation)
2.	**FAA**	
	a.	FAA Form 7460-1 (Notice of Proposed Construction or Alteration)
	b.	FAA Form 7580-1 (Activation of new airport)
	c.	FAA Form 7480-1 (Notice of Landing Area Proposal)
	d.	License upon completion of construction
	e.	FAA finding (if needed to secure federal funding pursuant to 49 USC § 47106(c)) that there is no possible and prudent alternative to the project and that every reasonable step has been taken to minimize adverse effects
	f.	FAA approval, in the event CCDOA seeks to levy and use passenger facility charges.
3.	**BLM**	
	a.	Approvals, as necessary, for mineral sampling and testing.
	b.	Approvals, as necessary, for extraction of gravel from federal land.
4.	**Army Corps of Engineers**	
	a.	Waters of the U.S. Determination for each alternative under review
5.	**U.S. Fish & Wildlife Service**	
	a.	Incidental Take Permit: Compliance with Endangered Species Act
	b.	Section 7 consultation
6.	**NOAA**	
	a.	Obstruction analysis
7.	**FCC**	
	a.	Frequency licenses
8.	**Clark County Permits**	

Permits/Approvals		
a.	Building Permit	
b.	Land Distribution Permit	
	i.	C.C. Multiple Species Habitat Conserv. Plan/Desert Tortoise requirements during Grading
	ii.	Right of Way Permit
		1. Improvement Plans
	iii.	Utility Improvement Plans, Submittals and Review
		1. Overhead Utilities Permit
	iv.	Time Restrictions on Work in Streets
	v.	Construction Traffic Control Plan
	vi.	Drainage Study Approval
	vii.	Encroachment Permit (Discharge Water)
	viii.	Grading Permit
		1. Conditional Grading Permit
c.	Commercial Sub-Permit	
	i.	Electrical
	ii.	Mechanical
	iii.	Plumbing
d.	Fence Permit	
e.	Sign Permit	
f.	Zoning	
g.	Land Use Application	
	i.	Administrative Design Review
	ii.	Administrative Extension of Time
	iii.	Administrative Minor Deviation
	iv.	Administrative Street Naming
	v.	Administrative vacation and Abandonment
	vi.	Annexation Request
	vii.	Design Review (except as noted below)
	viii.	Design Review, Projects of Regional Significance
	ix.	Special Use Permit (except as noted below)
	x.	Special Use Permit, Hazardous Materials
	xi.	Wavier of Conditions
	xii.	Vacation and Abandonment
	xiii.	Variance (except as noted below)
	xiv.	Variance, Projects of Regional Significance
	xv.	Waiver Conditions
	xvi.	Waiver of Development Standards (except as noted below)
	xvii.	Waiver of Development Standards, less than 30% deviation or non-public hearing
	xviii.	Waiver of Development Standards, Projects of Regional Significance
	xix.	Zone Change, Conforming
		1. Waiver of Conditions
	xx.	Zone Change, Nonconforming
		1. Waiver of Conditions
h.	Letter of Understanding (Requirements) – Pre building permit requirements	
	i.	Master Exiting Plans
	ii.	Life Safety Package
i.	Pre-Design Conference (Form)	
j.	Finish Floor Elevation Certificate	
k.	Certificate of Occupancy	
l.	Drainage Compliance Report	
m.	Landscape Certificate (Commercial)	
n.	Energy Schedule	
o.	Special Use Permit, Gaming Enterprise District Expansion	
p.	Major Project Application	
	i.	Concept Plan
	ii.	Development Agreement
	iii.	Specific Plan

Permits/Approvals
q. Off Site Plans Check
i. Off-site Construction Permit
r. Order of Vacation Attachment Exhibit "A"
s. Overhead Utility Permit
t. Architectural Review
u. Concept Plan and Planning Area Review
v. Public Facilities Needs Assessment
i. Transportation
ii. Police Protection
iii. Fire Department Survey
iv. Flood Control and Drainage
v. Parks and Open Space
vi. Schools
vii. Water and Sewer Services
w. Dust Control Permit
1. Dust Mitigation Plan
x. Permits related to Flood Control
i. Drainage Study Approval
ii. Encroachment Permit (Discharge Water)
iii. Grading Permit
iv. Temporary Sign Permit
v. Pad Certification for Grading and Earthwork
9. **Clark County Air Quality & Environmental Management**
a. Clark County Permits
i. Compliance Forms
1. Authority to Construct Application (ATC)
a. ATC Stationary Sources (if more than 1 year)
b. Worksheet Supplements
i. Boilers
ii. Emergency Generators (Check with Electrical)
iii. Cooling Towers
2. Various Location Permits (VLP)
3. Cooling Tower-Emission Unit Information Worksheet
4. Soil & Ground Water Remediation
10. **Nevada Department of Transportation (NDOT)**
a. NDOT Right-of-Way (ROW) Encroachment Permit
b. NDOT Traffic Barricade Plan Approval
11. **Clark County Fire Department**
a. Sprinkler Permit
b. Fire Alarm Permit
c. Water Permit (hydrants, etc.) Plan Approval
d. HD/AFES, Halon, Other Fixed Systems Permits
e. Fire Access Gates Permit (which obstructs a fire apparatus road)
f. Fire Extinguishing System and Equipment Permit
g. Alarm System, Equipment and Monitoring Permit
h. Smoke Control System(s) and Equipment Permit
i. Permit Survey Form
12. **Clark County Water Reclamation District**
a. Sewer Permit (a 3 part permit)
b. Pre-treatment Permit
13. **State of Nevada Division of Environmental Protection**
a. Storm Water Discharge Permits
b. Groundwater Discharge Permit
c. Clean Water Act (CWA) Section 401 Water quality certification
d. NPDES General Storm Water Permit for Construction
e. National Pollutant Discharge and Elimination System Temporary Discharge Permit

Permits/Approvals		
	f.	Hazardous/Solid Waste Permits
14.	**Nevada State Fire Marshal**	
	a.	Fire Alarm Submittal Requirements
	b.	Automatic Sprinkler Plan Submittal – based on NFPA 13
	c.	Building Code Plans Check
	d.	Application for Plans Review
	e.	Plans Review Submittal (Per NAC 477.030)
15.	**Clark County Department of Development Services**	
	a.	Grease Interceptor with Dishwasher
	b.	Grease Interceptor without Dishwasher
16.	**Nevada Division of Water Resources**	
	a.	Waiver for Dewatering Wells, Monitoring Wells, and/or Testing Wells (Ground Water)
17.	**Utility Services Permits / Coordination**	
	a.	Nevada Power Coordination
	b.	Sprint Coordination
	c.	Southwest Gas Coordination
	d.	Southern Nevada Water Authority Occupancy Permit
	e.	Cox Communications of Nevada