

EXECUTIVE SUMMARY

Introduction

This Alternatives Analysis document presents an evaluation of, and comparison between, two alternative sites currently being considered for the development of a new international airport to accommodate the long-term commercial aviation demands of San Diego County. It is the final phase of a comprehensive site selection process that began prior to the establishment of the San Diego County Regional Airport Authority (the Authority) in 2003 and a legislative mandate that the Authority identify a potential site, or sites, for a new airport and put that proposal before the County voters in the form of a ballot measure in November 2006.

Basis for this Report

The following briefly describes the context of, and framework for, the airport site selection program that is the basis for this report. Additional discussion is provided in Chapter 2, Background.

Alternative Sites Under Consideration

There are two civilian sites that are addressed in this document. One is located in eastern San Diego County, approximately 69 miles from the San Diego central business district, just south Interstate 8 (I-8) generally between the rural communities of Campo and Boulevard, and is referred to as the Campo/Boulevard Site (CBS). The other alternative is located near I-8 in western Imperial County, approximately 104 miles from the San Diego central business district, and is referred to as the Imperial County Desert Site (ICDS). In addition to these two sites, there are six other sites (in addition to the existing SDIA) currently under consideration in the Airport Site Selection Program (ASSP). These sites include five military sites and one additional civilian site, as identified below:

- March Air Reserve Base (ARB) (currently on hold)
- Marine Corps Base (MCB) Camp Pendleton
- Marine Corps Air Station (MCAS) Miramar
- East Miramar
- Naval Air Station (NAS) North Island
- Borrego Springs (currently on hold)

Alternatives analysis will begin on the military sites in January 2006 except as noted above for March ARB.

The development of a new international airport would include construction of dual parallel runways and associated taxiways, a passenger terminal, cargo facilities, parking areas/facilities, and general aviation and support facilities, all within an overall area of approximately 4,000-4,500 acres. Other on-airport improvements would include roads and utility systems. The airport would be designed to accommodate approximately 30 million passengers per year, with the ability to be expanded in the future to accommodate 45 million passengers per year if necessary.

The Need

The current San Diego International Airport (SDIA), situated on 661 acres, is simply too small to meet San Diego County's long-term air transportation needs. It is the only major commercial service airport in the nation with only one runway, which is severely limited due to terrain and other

obstructions surrounding the airport. By comparison, airports serving similarly sized regions have multiple runways and up to five times as much acreage. In 2004, SDIA handled more than 16 million passengers and approximately 209,000 arrivals and departures. As San Diego County's population grows and demand for air transportation increases, SDIA will simply not be able to meet the demand. This conclusion was affirmed by two earlier planning efforts – the SDIA Master Plan developed in 2001 and the 2001 Airport Economic Analysis conducted by HR&A. Aviation activity forecast prepared for the Airport predict that annual aircraft operations at SDIA would increase to 260,000 between 2015 and 2022, at which time runway congestion and delays would reach intolerable levels. Without new capacity in San Diego County, SDIA will reach full capacity and severely constrain the region's economic growth and well-being.

Site Selection is an Early Step

Recognizing the need for new airport capacity is only the first step in a lengthy and challenging process, which can take 10 to 20 years to complete. In the past 30 years many regions have considered developing a new airport but only one new major civilian airport has been built (the new Denver International Airport). The process is extensive, requiring approvals from numerous federal, state, and local agencies. The challenges are also enormous, involving environmental, social, political, jurisdictional, and financial issues, such as those illustrated below.

Airport Development Process



Successful new airport ventures require a solution that meets both policy and technical requirements. On the policy level, it must be based on a clear vision, have stakeholder buy-in and leaders must have the political will to make it happen. On the technical level, the solution must be a feasible plan. The technical work related to the ASSP focuses on technical feasibility. The ASSP has been designed in a manner to weigh and compare the relative technical feasibility of each alternative.

Technical Feasibility

While the decision on whether to pursue a new airport site for San Diego County's long range air transportation needs is a policy decision involving an extensive public decision process with numerous stakeholders, the cornerstone of a successful decision is a thorough understanding of the technical feasibility of each option. There are four fundamental tests that any option must pass in order to be a feasible solution to the region's long term aviation needs, which include: aeronautical requirements, environmental requirements, market reality, and financial feasibility. The final comparison and selection of a preferred option will be based in large part on these four factors. The following paragraphs describe these factors and summarize the fundamental findings of the work to date for the two sites evaluated.

Aeronautical Requirements

First and foremost, any proposed site must be acceptable from an aeronautical perspective. That is, the alternative must meet the basic airport planning requirements in terms of airfield, terminal/landside, ground access and support facilities. Runway approaches must be clear of obstructions and the regional airspace must be adequate to accommodate the forecast level of activity. Careful coordination with Federal Aviation Administration (FAA), users' group, and the military is important in this evaluation.

The Tier One screening analysis addressed some of the basic aeronautical requirements, as did the basic design of the concepts, so both sites meet the airport facility needs and function quite well on the ground. However, there is a fundamental difference between these alternatives from an airspace perspective. Both sites were evaluated to determine if they could support the efficient movement of arriving and departing aircraft between the airport site and the national airspace system. This analysis was conducted in coordination with the FAA, military and other airspace stakeholders. It was concluded from this analysis that while the CBS would work, the ICDS would not support the efficient movement of arrivals and departures due to its proximity to military Special Use Airspace and Mexican airspace. If the ICDS were to be pursued further, discussions would need to be escalated with the FAA, Department of Defense (DoD) and the State Department concerning the acquisition of additional airspace to support the efficient movement of air traffic at the ICDS. This issue is addressed further in Section 4.3.

Environmental Requirements

Ultimately federal, state, and local public agency approvals will be required for any proposed solution, so it is crucial to understand the key environmental issues that are likely to be of concern in the approval processes.

The Tier One Screening analysis provided an overview of environmental issues associated with these two sites. Both sites passed the Tier One Screening criteria.

The Alternatives Analysis provides a more comprehensive evaluation of the environmental issues associated with the two sites, covering over 20 environmental topics, ranging from traffic, air quality, and noise impacts, to housing impacts and community disruption, to impacts to the natural environment, such as biological communities, surface water, geologic and seismic considerations, visual impacts, and the like. This analysis identified a variety of notable environmental impacts from the construction and operation of on- and off-airport facilities; however, mitigation measures can reduce or avoid many of those impacts, as discussed in this document. The environmental feasibility of each site involves both a policy perspective (i.e., the desirability of selecting a site that is likely to have certain environmental impacts) and a regulatory perspective (i.e., are there certain

environmental impacts associated with a particular site that are likely to face a challenging regulatory approval process). Potential key environmental issues to consider with these two sites include, but are not limited to the following:

CBS

- The CBS is underlain by a groundwater aquifer that has been designated by the U.S. Environmental Protection Agency as a "sole source aquifer."
- The Quino checkerspot butterfly (federally listed endangered species) is located within the CBS vicinity and is likely to be present on or adjacent to the site, and the Peninsular bighorn sheep (also federally listed) is in the vicinity of the CBS. There are also wetlands located at and near the site.
- A substantial amount of excavation is required for site preparation, resulting in substantial grading-related air pollutant emissions.

ICDS

- The ICDS is located entirely within the BLM-designated management area for the flat-tailed horned lizard (a BLM sensitive species) and for cultural resources. Due to this designation, acquiring this land from the federal government will be challenging.
- The southeast portion of the ICDS is located within a designated 100-year floodplain, as is also a portion of the access road located between I-8 and the airport site.
- The ICDS is a public recreation area and is federally-designated for the protection of a sensitive wildlife species and for cultural resources; all of which are DOT Section 4(f) resources and would pose a notable challenge for Section 4(f) approval.

Market Reality

Market reality considers how airlines and air travelers are likely to respond to a particular new airport. It recognizes that airport authorities have limited ability to control the market. Airlines decide which airports they will serve and the type and quantity of air service that they will provide while air travelers decide whether to travel by air and, if so, which airport and airline they will use. A potential risk of a new airport is to build it in a location that is not attractive to airlines and passengers who are critical to its success.

The Tier One Screening analysis did not consider accessibility as a screening criterion. However, a preliminary review of the potential market response to these two sites under consideration was conducted as part of the First-Cut Screening Analysis, completed in February 2005. While that is not included in this document, its findings are important in weighing the overall technical feasibility of these alternatives. The accessibility review concluded that neither alternative would meet the full market potential due to their remote locations. It was estimated that 65 to 75 percent of the air travelers in San Diego County would use an airport at the CBS while only 50 to 60 percent would use an airport at the ICDS. The low market potential is due to the remote locations of these sites. Only 2 percent of the County's population would be within 75 minutes of the ICDS and the average drive time would be over 90 minutes. Twenty-nine percent of the residents would be closer to Los Angeles basin airports to the north compared to the ICDS. For the CBS, 63 percent of the County's population would be within a 75-minute drive to the airport. This preliminary market assessment was based on roadway access only. It is being updated to consider how a high-speed transit system (HSTS) could improve the accessibility of these sites. This market assessment will be updated in early 2006.

Financial Feasibility

The bottom-line question with any of the options under consideration is “*how much will it cost?*” and “*is it affordable?*” This Alternatives Analysis document presents a preliminary cost estimate but does not address the financial feasibility of the options. Financial feasibility will be addressed in a separate analysis beginning in January 2006. The key issues in addressing the financial feasibility is the consideration of the development cost and the financial risk inherent in each alternative. Financial risk will consider both market risk and implementation risk:

- **Market Risk** – This considers the uncertainty of the forecasted aviation activity associated with each alternative. As the uncertainty of the forecast increases, so does the financial risk. This analysis will be based on the market analysis that was described above and will translate that market risk into financial terms.
- **Implementation Risk.** Depending on the challenges related to implementation of an alternative, there will be uncertainty with regard to how easily and quickly airport development can be completed. The longer the duration of development, the higher the financing costs and the greater the financial risks due to various uncertainties. Addressing the implementation risk involves assessing the issues and uncertainties related to environmental approvals, permitting, site acquisition, site preparation and development.

The financial analysis will be initiated in early 2006 and will be completed in time for the Authority's decision process in April 2006. The development cost estimates presented in this document reveal that both of these new airport sites will be expensive and that the mitigation costs are highly speculative at this point. The summary cost estimate – including on-airport construction, off-airport construction and roadway improvement mitigation – is approximately \$16.7 billion for the CBS compared to \$17.4 billion for the ICDS. This difference is primarily, but not exclusively, due to the cost of earthwork and the cost of the HSTS. The extensive earthwork at the CBS results in an approximately \$2.5 billion higher cost for that site. On the other hand, the HSTS is \$2.6 billion greater at the ICDS due to the greater distance. In addition to the construction cost estimate, potential environmental mitigation costs associated with the two alternatives were estimated. These cost are shown as a range to reflect the high uncertainty associated with these estimates. The environmental mitigation cost, not including roadway improvement mitigation, ranges from \$.2 to \$1.6 billion for the CBS to \$.8 to \$4.9 billion for the ICDS.

Description of Alternatives

The two alternatives addressed in this document are referred to as the Campo/Boulevard Site (CBS) and the Imperial County Desert Site (ICDS). The following provides a summary of the information presented in Chapter 3, Alternatives Description, of this document.

Campo/Boulevard Site (CBS)

The CBS is located in unincorporated eastern San Diego County, south of Interstate 8 (I-8) approximately 69 miles driving distance from the Central Business District (CBD) of the City of San Diego, between the rural communities of Campo and Boulevard (see **Exhibit ES-1**). The 4,566-acre site is largely undeveloped, with the exception of scattered rural residential uses, and is characterized primarily by diverse rocky terrain and chaparral vegetation (see **Exhibit ES-2**).

The development of a new international airport at the CBS would include construction of dual parallel runways and associated taxiways, a passenger terminal, cargo facilities, parking areas/facilities, and general aviation and support facilities (see **Exhibit ES-3**). Other on-airport

improvements would include roads and utility systems. The airport would be designed to accommodate an activity level of approximately 30 million passengers per year, with the ability to be expanded in the future to accommodate 45 million passengers per year if necessary.

In conjunction with the development of an airport at the CBS, certain off-airport improvements would occur relative to enhancing ground access between the site and the population and employment centroid of San Diego County, and relative to the extension of utilities to the site. The off-airport ground access improvements would include the construction of additional travel lanes on segments of I-8 between the CBS and Interstate 15 to mitigate traffic impacts associated with passenger travel to and from the airport, or the development of a High-Speed Transit System (HSTS), such as a Magnetic Levitation ("Maglev") train or other high-speed transit system between the site and western San Diego County. Two alignment options for development of a HSTS for the CBS are addressed in this document; Alignment A, which generally follows I-8, and Alignment B, which generally follows State Route 94 (see **Exhibit ES-4**). The extension of utilities, such as electricity, natural gas, communications, and fuel delivery, to the CBS would occur along a proposed utility corridor that follows I-8, whereas the extension of water service to the CBS would occur via a pipeline that starts near Chula Vista and extends east, generally parallel to State Route 94, to Lake Morena and then on to the site (see **Exhibit ES-5**).

Imperial County Desert Site (ICDS)

The ICDS is located near I-8 in western Imperial County, in an unincorporated area approximately 104 miles driving distance east of the CBD of City of San Diego (see **Exhibit ES-6**). The 3,968-acre ICDS is characterized by undeveloped desert that is designated and used for off-road recreational travel. It is located approximately 2 miles west of agricultural fields that extend from the cities of Calexico and El Centro (see **Exhibit ES-7**).

Similar to the CBS described above, the airport at the ICDS would include construction of dual parallel runways and associated taxiways, a passenger terminal, cargo facilities, parking areas/facilities, and general aviation and support facilities (see **Exhibit ES-8**). Other on-airport improvements would include roads and utility systems. The airport would be designed to accommodate an activity level of approximately 30 million passengers per year, with the ability to be expanded in the future to accommodate 45 million passengers per year if necessary.

Also similar to the CBS described above, development of an airport at the ICDS would include certain off-airport improvements to enhance ground access and to extend utilities to the site. The off-airport ground access improvements would include the construction of additional travel lanes on segments of I-8 between the ICDS and Interstate 15 to mitigate traffic impacts associated with passenger travel to and from the airport, or the development of a HSTS between the site and western San Diego County. Two alignment options for development of a HSTS for the ICDS are addressed in this document; Alignment C, which would extend east from western San Diego straight to the ICDS, and Alignment D, which would be an easterly continuation of Alignment A or Alignment B, described earlier, from its terminus at the CBS to the ICDS (see **Exhibit ES-4**). Utilities, such as natural gas, communications, and fuel delivery, would be extended west from within El Centro to follow a proposed utility corridor along I-8, turning south at the ICDS access road, while the extension of water service to the ICDS would occur via a pipeline that extends from an existing water canal east of the site and the extension of electricity service would occur via a connection to an existing power line east of the site (see **Exhibit ES-9**).

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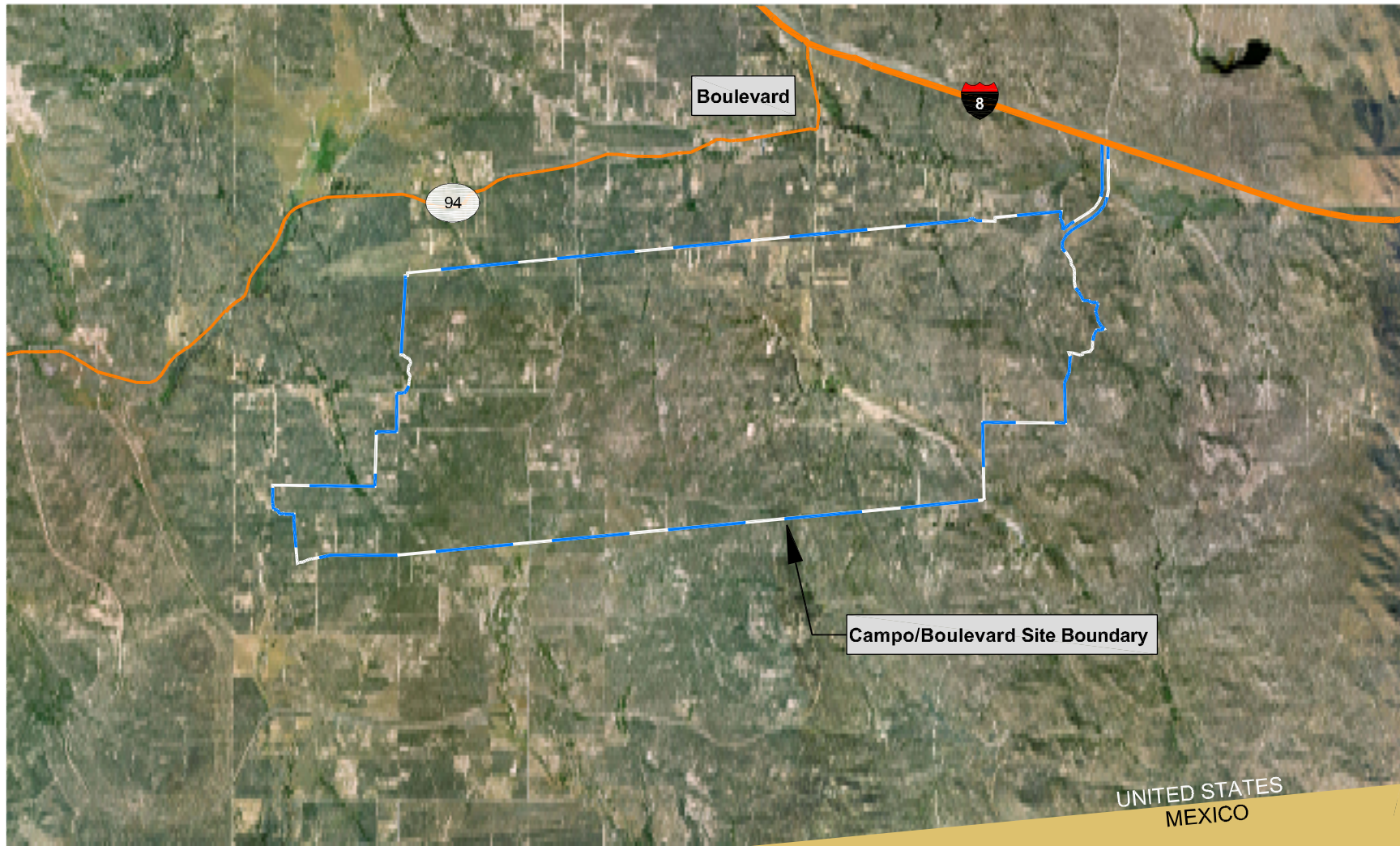
Source: Cartesia Map Art; Ricondo & Associates, Inc.

Exhibit ES-1

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north Not to scale

Campo/Boulevard Site Location Map

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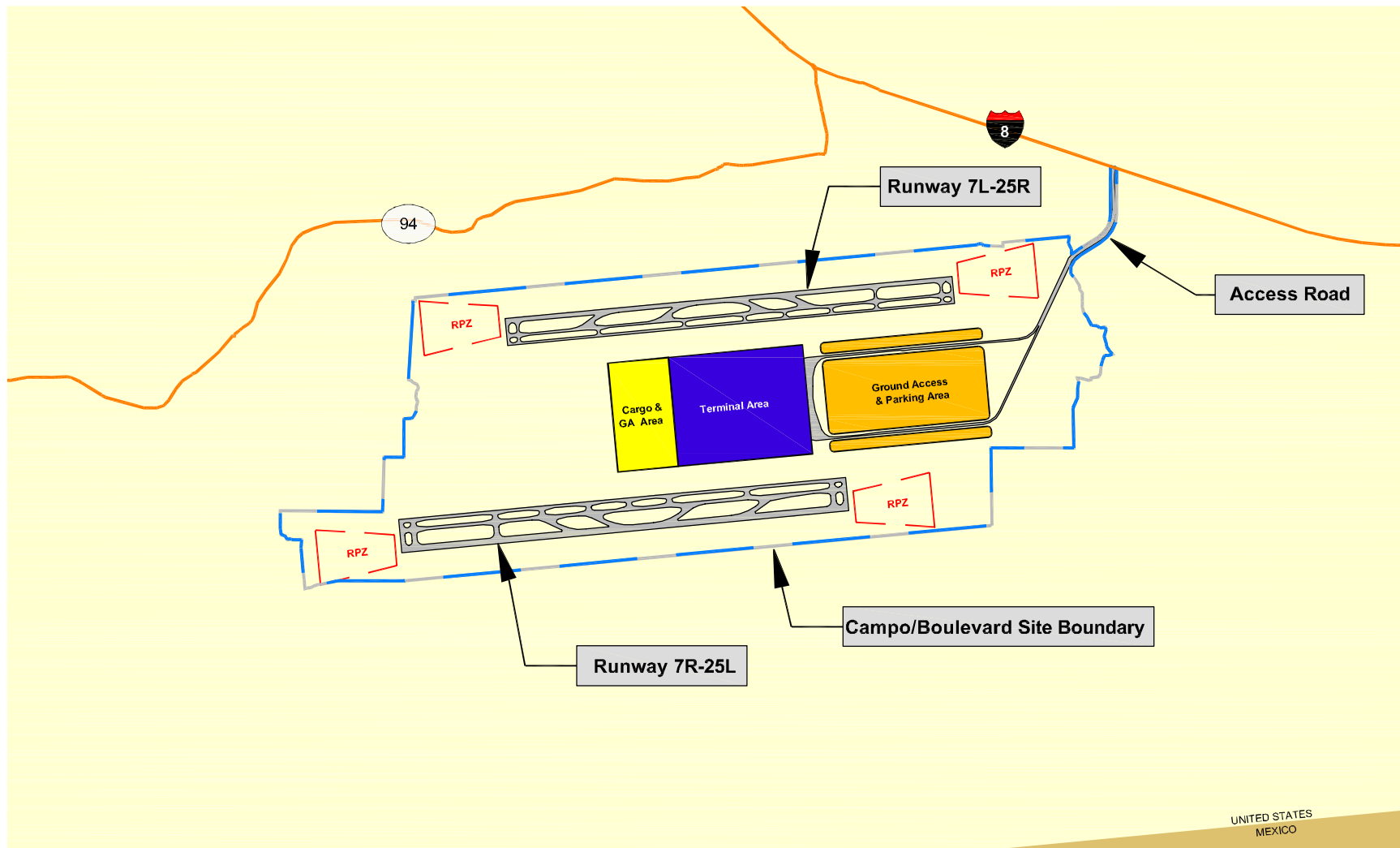
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Exhibit ES-2



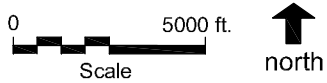
Campo/Boulevard Site Area Overview

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Source: Ricondo & Associates, Inc.

Exhibit ES-3



Note:
RPZ = Runway Protection Zone

Campo/Boulevard Site Proposed Airport Layout



Source: Kimley-Horn and Associates, Inc.

Exhibit ES-4



north Not to scale.

High Speed Transit System (HSTS) Concept Alignments from County Centroid to Campo/Boulevard and Imperial County Desert Sites



Source: 1997-2003 AirphotoUSA

Exhibit ES-5



Not to scale.

Legend:

- Proposed Natural Gas
- Proposed Water
- Proposed Aviation Fuel
- Proposed Electric
- Proposed Communication Conduit

Campo/Boulevard Site Utility Corridor Alignments

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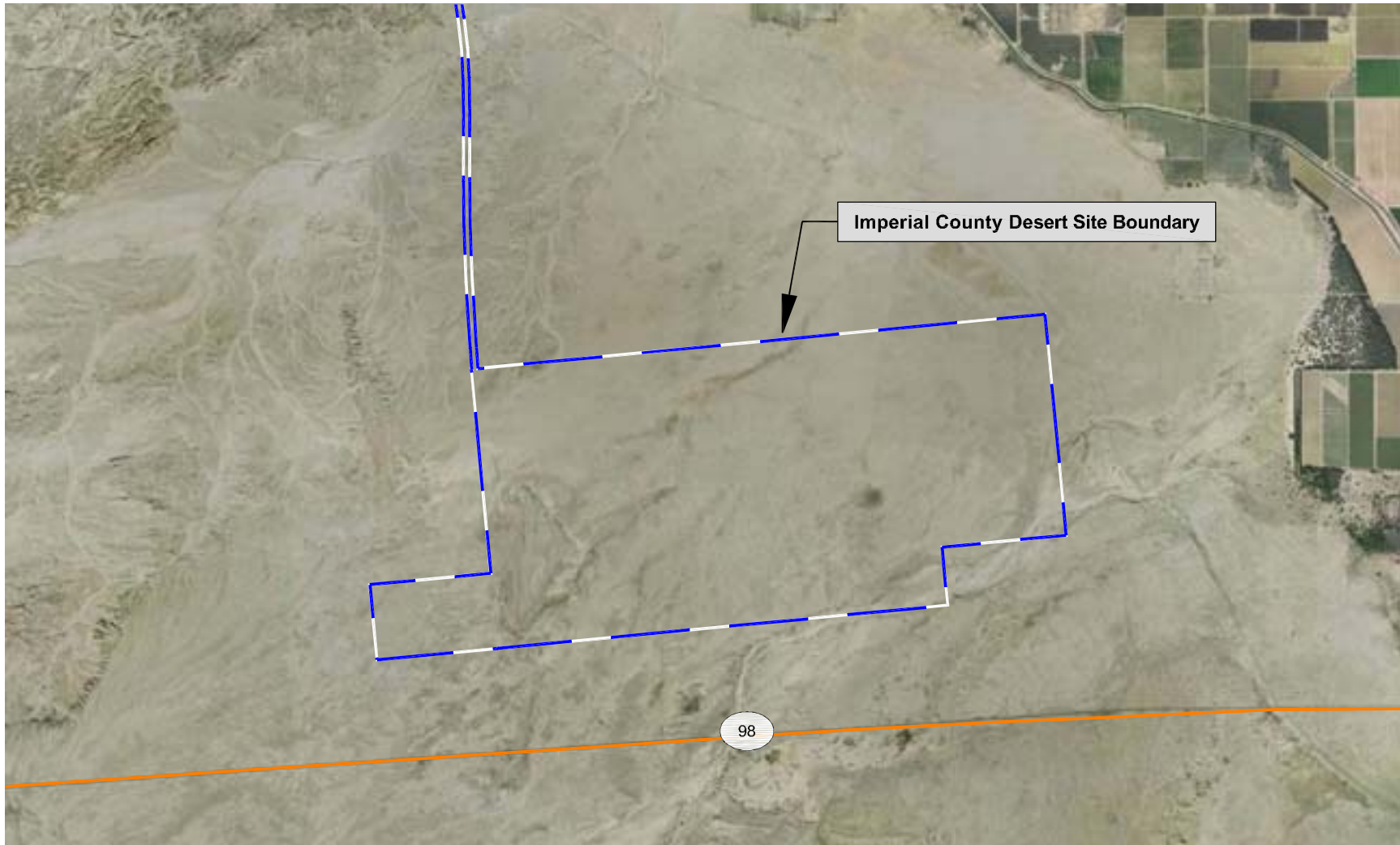


Source: Cartesia Map Art; Ricondo & Associates, Inc.

Exhibit ES-6

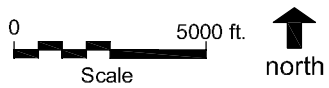
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Imperial County Desert Site Location Map

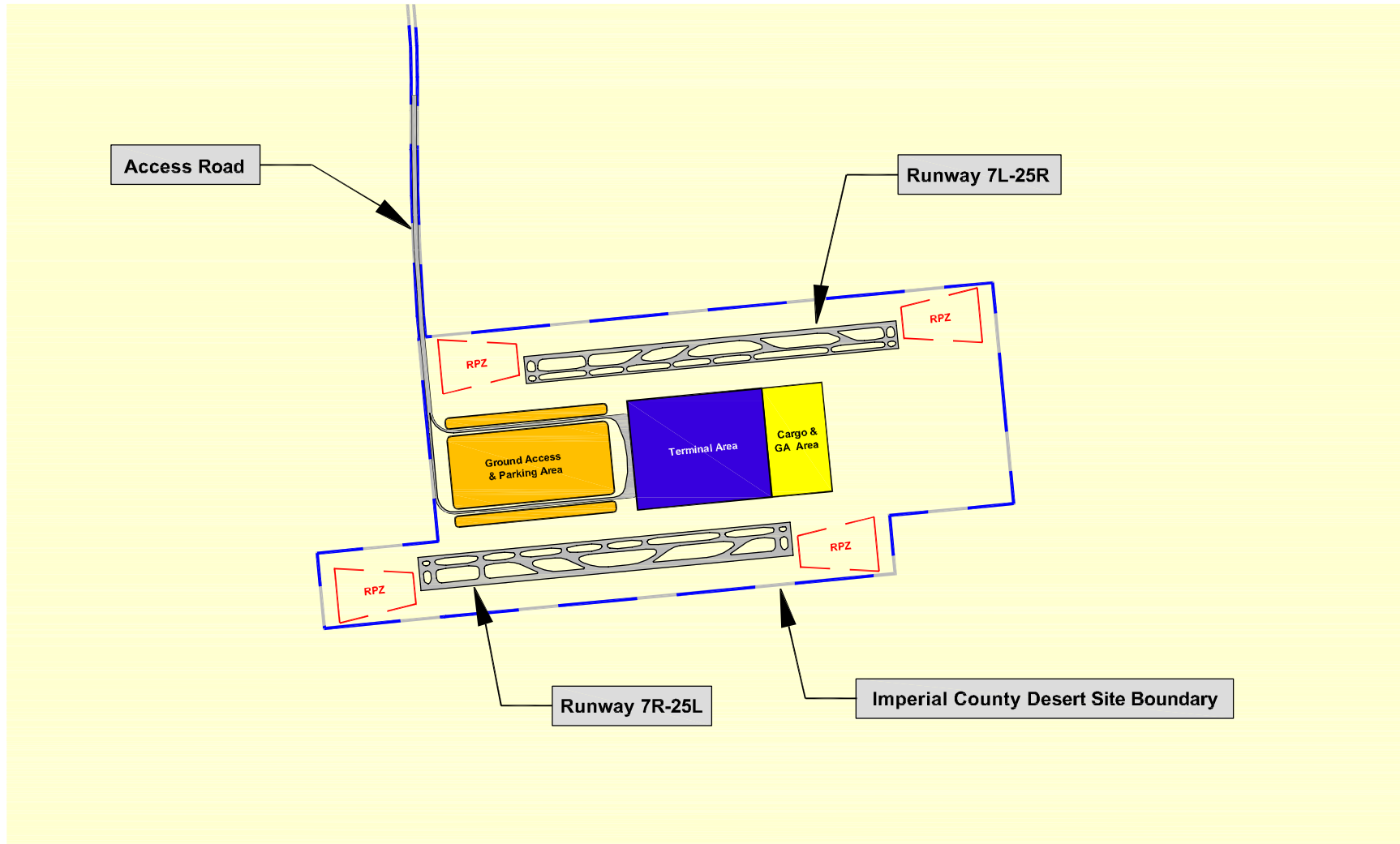


Source: Ricondo & Associates, Inc.

Exhibit ES-7



Imperial County Desert Site Area Overview



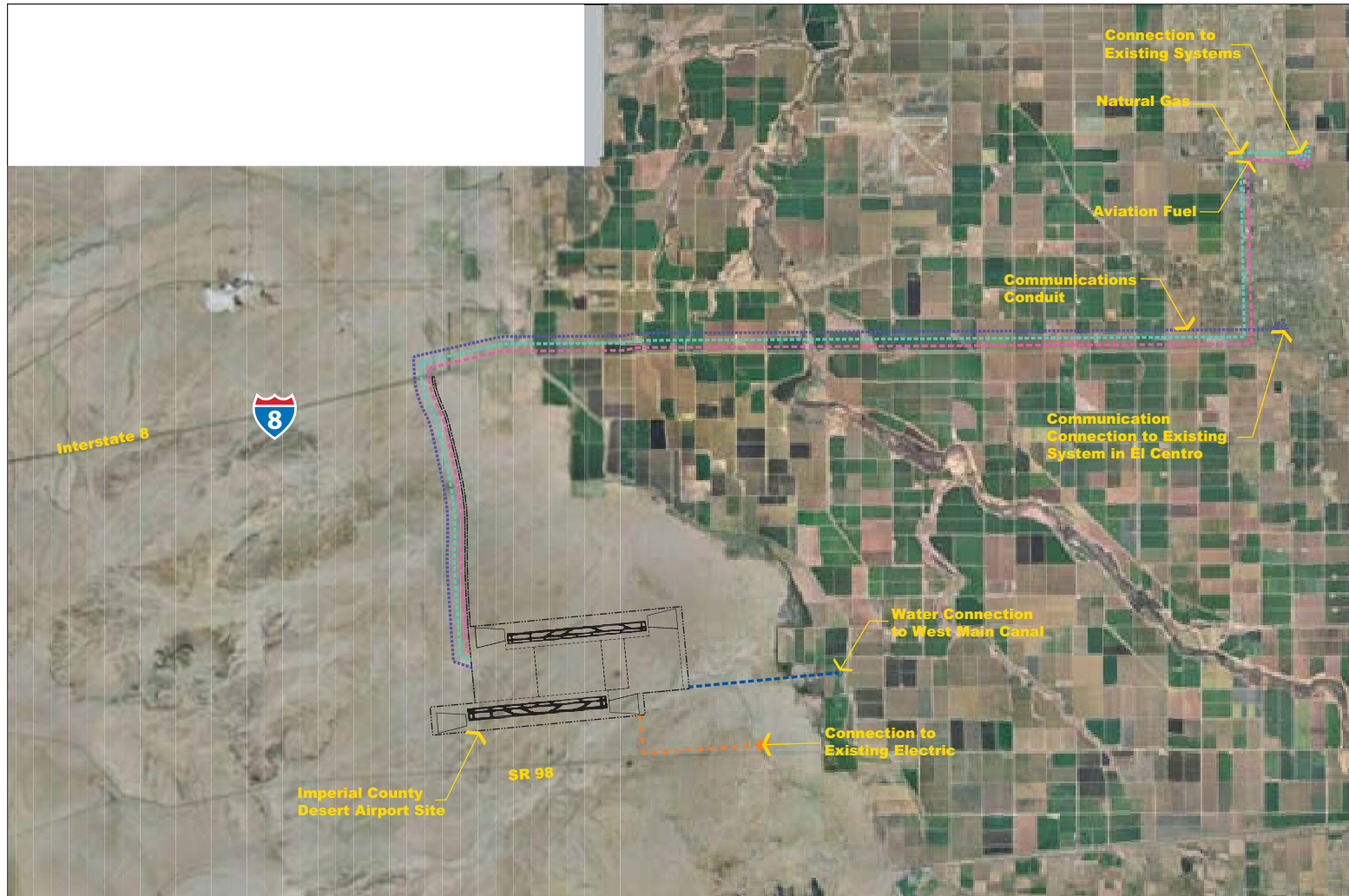
Source: Ricondo & Associates, Inc.

Exhibit ES-8



Note:
RPZ = Runway Protection Zone

Imperial County Desert Site Proposed Airport Layout



Source: 1997-2003 AirphotoUSA

Exhibit ES-9



north

Not to scale.

Legend:

Proposed Natural Gas

Proposed Aviation Fuel

Proposed Water

Proposed Electric

Proposed Communication Conduit

Imperial County Desert Site Utility Corridor Alignments

Summary of Alternatives Analysis

The following summarizes the main points of the detailed evaluation presented in Chapter 4, Alternatives Analysis, of this document. The summary includes each of the 30 issue areas addressed in Chapter 4, in the order presented therein.

Meteorological Considerations

Meteorological conditions (i.e., weather, wind conditions, and temperature) typical of any given area can influence the runway orientation determination, crosswind runway requirements, navigational aid requirements, runway use configurations, and runway length requirements for an airport in that area. The meteorological analysis completed for this study, presented in Section 4.1, serves to determine whether sufficient wind coverage is available to efficiently operate an airport given the proposed runway orientations, and to identify any need for a crosswind runway.

The analysis found that meteorological conditions at the CBS are favorable for the development of the proposed airfield configuration. The runway alignment provides very good coverage for wind conditions experienced in the area, well in excess of the FAA minimum of 95 percent crosswind coverage. Ceiling and visibility data is not available for the CBS area; however, given the site's elevation, it is possible that instrument or poor visibility conditions do occur more frequently than at the ICDS, which is located in an area that experiences very low levels of instrument conditions. Precision instrument approach capabilities are possible at the CBS, therefore the airport would remain operational at all times regardless of visibility and wind conditions. The mean maximum daily temperature during the hottest month of the year is 91.1 degrees F. Runways proposed for the CBS are 14,400-ft. long, which provides sufficient length to accommodate the critical aircraft, a Boeing 747-400 at maximum takeoff weight, at the CBS during temperature conditions of 91.1 degrees F.

Similarly, meteorological conditions at the ICDS are favorable for development of the proposed airfield configuration. The runway alignment provides very good coverage for wind conditions experienced in the area, exceeding the FAA requirement for 95 percent crosswind coverage. Visibility conditions are excellent, with instrument or poor visibility conditions experienced only 0.38 percent of the time. The mean maximum daily temperature during the hottest month of the year is 107.5 degrees F. Runways proposed for the ICDS are 12,000 ft. long, which provides sufficient length to accommodate the critical aircraft, a Boeing 747-400 at maximum takeoff weight, at the ICDS during temperature conditions of 107.5 degrees F.

There are no notable differences in meteorological conditions between the CBS and ICDS relative to the proposed airfield development, and the proposed airfield configuration at each site is well-suited to the local meteorological conditions.

Airport Facilities and Operational Efficiency

The airport facilities and operational efficiency analysis completed for this study, presented in Section 4.2 of this document, evaluates the ability of the proposed international airport configuration at each alternative to accommodate the long-term demand for aviation activity in San Diego County, and the general facility requirements necessary to support that activity.

The proposed airport configurations at the CBS and ICDS were developed to accommodate PAL 30 demand, with space preserved for expansion beyond PAL 30, as appropriate. The analysis found that the airport facilities at both the CBS and ICDS are sufficient to accommodate the PAL 30 activity level and future expansion to PAL 45.

Airspace

The airspace analysis completed for this study, presented in Section 4.3 of this document, evaluates the compatibility of the aircraft flight characteristics (i.e., aircraft arrivals and departures) of each alternative with existing regional air traffic operating system in and around San Diego County. For the analysis, an operational assessment of the alternative sites was completed by Federal Aviation Administration (FAA) personnel at the Southern California TRACON (TRACON), and the Los Angeles Air Route Traffic Control Center.

The analysis of airspace considerations associated with the CBS found that airport configuration proposed for that site would allow for simultaneous arrival and departure operations in visual flight rule (VFR) conditions from the east and west, and simultaneous instrument landing system (ILS) approaches can be conducted in instrument flight rule (IFR) conditions from the east and west. Arrivals and departure operations can be accommodated with a redesign of the terminal and enroute airspace without adversely impacting operations at existing airports.

The airspace analysis conducted for the ICDS identified significant operational constraints, based on the following considerations:

- As proposed, the ICDS would not achieve the full capacity and efficiency that would normally be associated with a two parallel runway operation due to its location between military Special Use Airspace (SUA) and Mexican airspace.
- Analysis by the ASSP Technical Team, FAA, and the Department of Defense (DoD) determined that a shared airspace scenario with the DoD or Mexico was not practical. In each scenario, the ability of one of the parties to effectively and efficiently achieve their mission was impacted.
- Analysis by the Los Angeles Air Route Traffic Control Center determined that an effective airspace design could not be accomplished to accommodate efficient operations into and out of ICDS as proposed.

It was concluded that the ICDS would not support the efficient movement of arrival and departure traffic at the airport. Additional airspace would need to be designated for air traffic operations at the airport in order to achieve the full benefit of such a large capital investment. The required approach control airspace would extend 40 nautical miles east/west of the airport on a line 20 nautical miles to the north and south of the site. This airspace would need to be permanently assigned to the Southern California TRACON. This proposed airspace configuration resolves the FAA airspace and operational issues identified in this analysis and would allow for the efficient movement of air traffic at the ICDS; however, it does not address the issues identified in the analysis concerning the military SUA and Mexican airspace.

If the ICDS is to be pursued, discussions would need to be escalated with the FAA, DoD, and the State Department concerning the acquisition of additional airspace for the Southern California TRACON and Los Angeles Air Traffic Control Center to support efficient air traffic operations at the ICDS.

Security and Vulnerability Assessment

The analysis of issues related to airport security and vulnerability contains confidential information, which has been provided under separate cover to San Diego County Regional Airport Authority Board members. With respect to a comparison between the CBS and the ICDS, which is the primary

focus of the ASSP Alternatives Analysis, the evaluation found that there are no major differences between the two alternatives relative to airport security and vulnerability.

Ground Access

The ground access analysis completed for this study, presented in Section 4.5 of this document, addresses regional ground access considerations for, and future transportation conditions associated with, each alternative airport location. The analysis describes the existing regional highway network related to the two alternative sites, estimates of the trip generation and trip distribution associated with each site, and discusses future traffic conditions both with and without airport traffic (e.g., accounting for future regional growth and improvements to the highway network that are anticipated to occur with or without the ASSP). The analysis identifies the regional transportation improvements required to accommodate the traffic forecast volumes resulting from airport operations, and considers the possibility of developing high-speed transit systems (i.e., a Magnetic Levitation -"Maglev"- train or other high-speed transit system), as a possible means of transportation to and from each alternative site. The potential HSTS alignments considered for each alternative are shown in Exhibit ES-4, presented earlier.

It is estimated that approximately 144,000 vehicle trips per day would be generated from operation of an airport (at PAL 30) at either site, including 6,150 trips during the morning peak hour and 8,160 trips during the afternoon peak hour. Impacts resulting from this trip generation are summarized as follows:

- Primary access to and from either CBS or ICDS would be via I-8, with approximately 99 percent of the trips to and from each site occurring on I-8 west of each site. I-8 would experience substantial traffic congestion as a result of project implementation;
- Under year 2030 conditions, segments of I-8 in more urbanized areas of San Diego County (i.e., west of State Route 67) would be characterized by Level of Service (LOS) E or F conditions, which represent poor operating conditions with substantial to severe traffic congestion. Airport-related traffic would worsen the congestion on those segments, and would result in LOS E or F conditions extending to the four-lane freeway segments in the eastern part of the County;
- Between one and three additional lanes in each direction would be required along several segments of I-8 in order to accommodate airport-related traffic under either alternative;
- Development of a HSTS would be expected to reduce vehicular ground access impacts associated with either alternative, but would be difficult and costly to implement; and
- Relative to ground access, the ICDS alternative would have substantially greater impacts than the CBS in terms of miles of congestion on I-8 (93 miles of congested I-8 segments east of I-15 for the ICDS versus 60 miles for the CBS) and vehicle miles of travel, i.e., the collective total distance that the 144,000 vehicle trips per day would travel (16.2 million versus 9.4 million for the CBS).

Utilities

The utility services analysis completed for this study, presented in Section 4.6 of this document, discusses the projected utility demands associated with the operation of an airport at each site, as related to potable water, wastewater treatment/disposal, electricity, natural gas, aviation fuel, and communications (phone, internet, cable). Based on those demands, potential options for providing utility services at each site are described, including where and how connections to existing utilities

could occur and where new utility lines could be constructed to connect with each site. Some utilities have various options for extension of service to each site, as described in Section 4.6; however, only the most viable option for each utility was evaluated in the impacts analyses of Chapter 4. Exhibits ES-5 and ES-9, presented earlier, delineate the off-airport utility corridor alignments and connection points relative to the CBS and the ICDS, respectively. The following summarizes the utility system improvements proposed for each site.

In comparing the two alternatives, there would not be any notable differences in the ability to provide utility services; however, there would be a substantial difference in the estimated costs of the utility improvements associated with each site, as described in the construction cost estimate summary below.

Land Acquisition, Relocation Requirements

The evaluation of land acquisition and relocation requirements, presented in Section 4.7 of this document, addresses the processes and options available for acquisition of privately held and federal land in San Diego and Imperial Counties, and the associated level of complexity for the two alternatives.

Land acquisition impacts for an airport development at the CBS or ICDS are summarized below, and are followed by a summary of the relocation requirements associated with each alternative.

Land acquisition process complexity is likely to be much higher at the ICDS due to the high proportion of land designated as California Desert Conservation Area (CDCA) and Area of Critical Environmental Concern (ACEC) within the acquisition area. Acquisition at the CBS is likely to be moderately complex due to relocation requirements and the number of individual owners.

With the exception of Alignment C, the proposed high-speed transit system routes west of the CBS are the same for each airport site. The ICDS would require additional land acquisition for alignment right-of-way to the east of CBS, resulting in additional impacts. The improvements to I-8 may also require additional acquisition for right-of-way to the east of the CBS site. Utility line extensions for the CBS may require more land acquisition than the ICDS, particularly in urban and residential areas potentially resulting in higher costs.

Overall, development of an international airport at the ICDS would be more challenging from the standpoint of land acquisition because of its status as a designated ACEC within the CDCA.

Table ES-1**Land Acquisition and Residential Relocation Requirements**

	CBS	ICDS
Land Acquisition Summary		
Airport Footprint Area (acres)	4,566	3,968
Land Acquisition Impact Area – Number of Parcels	209	21
Land Acquisition Impact Area – Area by Property Type (acres)		
Residential	1,174	0
Commercial/Industrial	200	0
Agricultural	5,014	0
Undeveloped	16	10,501
Total Acres of Acquisition	6,404 ^{1/}	10,501
Residential Relocation Requirements Summary		
Number of Occupied Residential Parcels	75	0
Number of Housing Units Requiring Relocation	77	0
Residential Population Requiring Relocation	225	0
Number of Businesses Requiring Relocation	6	0
Number of Farms Requiring Relocation	89	0
Number of Non-Profit Organizations Requiring Relocation	1	0

^{1/} Total acres of acquisition exceed acreage of airport footprint area because parcels located along the periphery of the airport footprint extend beyond the site boundary (i.e., acquisition of entire parcels would include on-site portion of each parcel, as well as that portion of the parcel that extends off-site).

Source: Ricondo & Associates, Inc., 2005.

Noise

The noise analysis, presented in Section 4.8 of this document, describes the existing noise setting for each alternative site, as well as for the associated off-airport improvements area, and addresses noise levels and resultant impacts from aircraft, roadway, high-speed transit system (HSTS)^{1/} and construction activity that is expected to occur both off- and on-airport for the two alternatives.

Potential adverse noise impacts from aircraft, roadway, HSTS and construction are present for both the CBS and ICDS, but at different degrees when compared to each other. Provided below is a summary of the potential adverse noise impacts associated with, and compared between, the two alternatives. Following that is a summary comparison of the potential adverse noise impacts of the off-airport improvements associated with the two alternatives. Potential mitigation measures to address such impacts are provided thereafter.

^{1/} For purposes of this noise analysis, the type of transit technology assumed for HSTS is magnetic levitation (Maglev).

Table ES-2

Potential Adverse Noise Impacts Summary - Airport Improvements

<u>Noise Source Category</u>	<u>CBS - Potential Adverse Impacts</u>	<u>ICDS - Potential Adverse Impacts</u>
Construction Equipment Noise	<ul style="list-style-type: none">• Approximately 7 residents, 15 dwelling units and 86 residential acres may be impacted by hourly construction noise levels exceeding 75 dBA $L_{eq(h)}$.• An additional 8 residents, 24 dwelling units and 183 residential acres may be impacted by an increase of 75 CNEL or higher in noise levels caused by construction.	<ul style="list-style-type: none">• No potential noise impacts are anticipated.
Construction Traffic Noise	<ul style="list-style-type: none">• No potential noise impacts are anticipated.	<ul style="list-style-type: none">• No potential noise impacts are anticipated.
Aircraft Noise	<ul style="list-style-type: none">• Surrounding areas may experience a substantial increase in ambient noise levels due to aircraft operations.• 37 residences and 108 people would be exposed to noise levels of 65 CNEL and greater, and would also experience an increase in noise of 1.5 DNL or more.	<ul style="list-style-type: none">• No potential noise impacts are anticipated.
Airport Facilities and Access Roadway	<ul style="list-style-type: none">• Approximately 31 dwelling units, 14 residences, and 133 residential acres may be potentially impacted by airport facility noise.• Noise levels along the access road to CBS may increase up to 7 dBA.• Several parcels adjacent to the proposed access road may be impacted by acquisition requirements.	<ul style="list-style-type: none">• No potential noise impacts are anticipated.

Source: Ricondo and Associates Inc., 2005.

Table ES-3

Potential Adverse Noise Impacts Summary - Off-Airport Improvements

Noise Source Category	CBS - Potential Adverse Impacts	ICDS – Potential Adverse Impacts
Construction Equipment Noise	<ul style="list-style-type: none"> Construction noise impacts for off-airport improvements may potentially cause adverse temporary noise impact to nearby noise-sensitive areas such as residential. For HSTS construction, bridge and tunnel construction noise levels (using impact-based and tunneling equipment) may potentially impact nearby noise-sensitive locations temporarily. For HSTS, required earthwork may result in potential temporary noise impacts. Construction of the proposed aviation fuel, water, natural gas, and communication utility corridors may incorporate a potential adverse temporary noise impact for residents located along the I-8 corridor between Mission Valley and SR-79. 	<ul style="list-style-type: none"> Construction noise impacts for off-airport improvements may potentially cause adverse temporary noise impact to nearby noise-sensitive areas such as residential. For HSTS construction, bridge and tunnel construction noise levels (using impact-based and tunneling equipment) may potentially impact nearby noise-sensitive locations temporarily. For HSTS, required earthwork may result in potential temporary noise impacts. Construction of the second leg of the proposed fuel and natural gas utility corridors (heading south through El Centro) may potentially impact nearby noise-sensitive uses.
Construction Traffic Noise	<ul style="list-style-type: none"> No potential noise impacts are anticipated. 	<ul style="list-style-type: none"> No potential noise impacts are anticipated.
Roadway Traffic Noise	<ul style="list-style-type: none"> The reduction in buffer space combined with the increase in traffic volume along the segment of I-8 stretching from the I-15 junction to SR 125 may result in sufficient noise to potentially impact residential areas within the 60 CNEL noise exposure area. The segment of I-8 between SR 79 and SR 94 would experience an average PM peak hour traffic volume increase of 227%. This represents a potential noise impact for nearby noise sensitive areas along this segment. The segment of I-8 between SR 94 and McCain Valley Road would experience a 384 increase in average AM peak hour traffic volume and a 624 increase in average PM peak hour traffic volume. This represents a potential noise impact for nearby noise sensitive areas along this segment. 	<ul style="list-style-type: none"> The reduction in buffer space combined with the increase in traffic volume along the segment of I-8 stretching from the I-15 junction to SR 125 may result in sufficient noise to potentially impact residential areas within the 60 CNEL noise exposure area. The segment of I-8 between SR 79 and SR 94 would experience an average PM peak hour traffic volume increase of 227%. This represents a potential noise impact for nearby noise sensitive areas along this segment. The segment of I-8 between SR 94 and McCain Valley Road would experience a 384 increase in average AM peak hour traffic volume and a 624 increase in average PM peak hour traffic volume. This represents a potential noise impact for nearby noise sensitive areas along this segment. The segment of I-8 between McCain Valley Road to Dunaway Road would witness an increase in AM average hourly traffic volume of 367 and an increase in PM average hourly traffic volume of 365. This represents a potential noise impact for nearby noise sensitive areas along this segment.

Noise Source Category	CBS - Potential Adverse Impacts	ICDS – Potential Adverse Impacts
HSTS Noise	<ul style="list-style-type: none"> Alignment Concept A – 846 acres of the 4,562 acre study area may experience potential noise impacts. Alignment Concept B – 784 acres of the 4,116 acre study area may experience potential noise impacts. 	<ul style="list-style-type: none"> Alignment Concept C - 1,342 acres of the 4,741 acre study area may experience potential noise impacts. Alignment Concept A+D - 904 acres of the 6,953 acre study area may experience potential noise impacts. Alignment Concept B+D – 876 acres of the 6,697 acre study area may experience potential noise impacts.

Source: Ricondo and Associates Inc., 2005.

Table ES-4

Potential Noise Impacts - Mitigation Measures

Noise Source Category	Mitigation Measures
Aircraft Noise	<ul style="list-style-type: none"> Modifying or converting incompatible land use to compatible through installation of sound insulation, rezoning, or property acquisition. Increase distances between aircraft and noise sensitive areas through facility or operational modifications. Development of a comprehensive Airport Land Use Compatibility Plan.
Roadway Traffic Noise	<ul style="list-style-type: none"> Traffic controls Highway pavement materials Sound barriers Earth berms Converting incompatible land use to compatible (e.g., sound insulation)
Construction Traffic Noise	n.a. ^{1/}
Construction Equipment Noise	<ul style="list-style-type: none"> Construction project design and layout Sequence of operations Alternative construction methods
HSTS Noise	<ul style="list-style-type: none"> Converting incompatible land use to compatible (e.g., sound insulation) Sound barriers Operational restrictions

^{1/} n.a. = Not Applicable

Source: Ricondo and Associates Inc., 2005.

Air Quality

The air quality analysis, presented in Section 4.9 of this document, characterizes the existing air quality setting for each alternative site and evaluates the potential impacts to air quality that would result from development of an airport and associated off-airport improvements. The impacts analysis accounts for air pollutant emissions from on-airport sources such as aircraft operations, on-site stationary sources, and vehicular travel associated with on-airport activities, as well as from off-airport sources such as the I-8 highway improvements, utility corridors improvements, and high-speed transit system.

Both the CBS and the ICDS are located in rural and/or relatively undeveloped areas with few man-made sources of air pollution. There are no notable industrial uses in the immediate vicinity of either site. The predominant source of air pollutants in the vicinity of both sites is motor vehicles traveling on I-8 and other roadways. Based largely on the nature, size, and location of the airport proposed under either of the two alternatives, the construction-related and the operations-related air quality impacts would be substantial and adverse. The following summarizes the extent to which emissions of criteria pollutants would exceed the quantitative thresholds identified in this document as defining an adverse air quality impact.

Table ES-5

Extent to Which Air Pollutant Emissions Exceed Thresholds for Adverse Impacts

Pollutant	Extent to Which Emissions Exceed Thresholds for Adverse Impacts ^{1/}					
	Campo/Boulevard Site (CBS)			Imperial County Desert Site (ICDS)		
	Construction ^{2/}	Grading Only ^{3/}	Operations	Construction ^{2/}	Grading Only ^{3/}	Operations
Volatile Organic Compounds (VOC)	43.1x	14.2x	10.9x	43.2x	1.6x	11.8x
Carbon Monoxide (CO)	10.9x	10.9	26.6x	11.3x	1.2	28.0x
Oxides of Nitrogen (NO _x)	105.4x	105.4	99.4x	92.7x	12.6x	104.8x
Oxides of Sulfur (SO _x)	0		5.2x	0		5.6x
Particulate Matter - 10 (PM10)	363.4x	363.4	1.3x	38.6x	38.6	1.4x

^{1/} Based on a comparison of the values in Table 4.9.1 (Thresholds) and Table 4.9.7 (Emission estimates for each alternative), and expressed in terms of a factor by which the threshold is exceeded (i.e., if the threshold is 100 pounds per day and the estimated emissions are 300 pounds per day, the threshold would be exceeded three times or "3x").

^{2/} Based on the peak daily construction emissions, which may be associated with grading or with building/structure construction, whichever is greater.

^{3/} Based on the peak daily grading emissions only.

Source: CDM, 2005.

As indicated above, the extent to which grading-related thresholds are exceeded would be substantially more for the CBS alternative than for the ICDS alternative. The main reason for this is that the extent of grading required to make the CBS, situated in diverse mountainous terrain, suitable for airport development would be far greater than that required for the ICDS, which is located on relatively flat desert terrain. Relative to operations-related emissions, the extent to which the thresholds would be exceeded is about the same for both alternatives. The emissions for the ICDS are slightly higher than those of the CBS due mainly to the greater distance that passengers from the San Diego region would need to drive in order to reach the ICDS. Other emissions related to on-airport activities, such as aircraft operations, ground service equipment, and stationary sources would generally be the same between the two alternatives.

Air pollutant emissions associated with the off-airport improvements would occur primarily from construction activities, with the most notable emissions likely to occur from construction of a HSTS. There would be no notable emissions associated with operation of the I-8 highway improvements (i.e., vehicle emissions on I-8 would occur with or without the improvements, although traffic flows

would be improved with the improvements) or the utility extensions. Operations-related emissions associated with the HSTS would depend on the system design, with Maglev-system or other electric-powered-system emissions being indirect stationary source emissions associated with the generation of electricity to power the system, and emissions associated with a more traditional system (i.e., diesel-electric locomotive) being direct mobile source emissions.

Numerous potential mitigation measures are available for construction-related and operations-related emissions; however, it is unlikely that these measures would be sufficient to reduce either alternative's emissions to a level less than substantial and adverse.

Natural Environment:

Geological, Geotechnical, and Seismic

The analysis of geological, geotechnical, and seismic, (referred to collectively as "geotechnical" henceforth) considerations, presented in Section 4.10.1 of this document, addresses the potential for the construction and operation of an airport at either site to be adversely affected by geotechnical conditions such as the potential for faulting, seismic shaking, liquefaction, tsunamis, shallow groundwater, rippability (excavatability) of bedrock, expansive soils, flash floods, and soils subject to settlement. Such considerations are also generally considered relative to the off-airport improvements associated with each alternative. In cases where the evaluation found that adverse geotechnical conditions are likely to be present, based on review of available information, a recommended mitigation approach is provided. The following summarizes the estimated severity, in terms of low, moderate, or high, of potential geotechnical impacts associated with each alternative, and also identifies the type of mitigation approach recommended for each category of adverse geotechnical conditions.

Table ES-6

Potential Severity of Geotechnical Impacts

Geotechnical Condition	Mitigation	CBS	ICDS
Faulting	Proper Design	Low	Low-Moderate ^{1/}
Seismic Shaking	Proper Design	Moderate	Moderate
Liquefaction	Proper Design	Low	Low
Tsunamis	Proper Design	Low	Low
Groundwater	Proper Design	Low-Moderate ^{1/}	Low-Moderate ^{1/}
Excavatability	Blasting	High	Low
Expansive Soils	Proper Design	Low	Moderate-High
Soils subject to settlement	Remedial Grading	Moderate	Moderate

^{1/} Little data available.

Source: Ninyo & Moore, 2005.

With respect to overall impacts of geotechnical conditions at each of the alternative sites, the ICDS would be less impacted than the CBS, due to the relatively greater extent and difficulty of site

preparation for the CBS than for the ICDS (i.e., excavation of large amounts of granitic rock required for the CBS, whereas site preparation at the ICDS would only require mitigating a comparatively smaller quantity of expansive soils, which is less challenging than the CBS issue). The geotechnical condition needing mitigation at the ICDS is the loose condition of the surficial alluvial soils. Mitigation would entail removing these soils during grading and replacing them as compacted fill. Expansive soils, if encountered, would be mitigated during the removal and replacement of the loose alluvial soils. Geotechnical conditions needing mitigation at the CBS include undocumented fill soils, loose alluvial soils, and unweathered granitic rock. Mitigation of these conditions would entail removal of undocumented fills and alluvial soils and replacement with compacted fill and a substantial amount of blasting of hard granitic rock. In summary, while there are no insurmountable geological issues at either site, the ICDS alternative may be considered to be the more feasible and less impacting alternative with regards to geotechnical issues.

Hydrology

The analysis of hydrology issues, specifically surface drainage, presented in Section 4.10.2 of this document, provides an overview of the existing hydrology and hydraulic conditions for each site, and for the proposed conditions once an airport is developed.

In general, it is anticipated that both sites could be successfully designed, engineered, and constructed to provide adequate drainage and flood control; however, given that the ICDS is situated in a relatively flat, low-lying wash that includes a portion of a designated floodplain, the ability to provide adequate drainage and flood control at the ICDS would be more challenging than at the CBS. The following provides a comparison of drainage system considerations for the two sites:

The main difference in impact between the two sites is due to the need at the ICDS to:

- construct storm drain facilities at relatively flat slopes which cause larger capacity pipes to be required;
- construct off-site facilities to carry drainage to the New River. Off-site drainage facilities from the ICDS to the New River include approximately 4 miles of 10' X 11' double box culverts as well as reconstruction of a portion of the existing Imperial Irrigation District canal that is just downstream of the proposed airport site; and
- re-route the Pinto Wash at the southeast corner of the ICDS.

Permitting impacts are also higher at the ICDS due to the need to reroute Pinto Wash, which extends through the southeast portion of the site.

Water Quality

The analysis of water quality issues, presented in Section 4.10.3 of this document, describes surface water and groundwater resources located at, or near, each alternative site, and addresses potential water quality impacts to those resources that could result from the construction and operation of a new airport. Also provided is a general discussion of water quality impacts associated with the off-airport improvements.

Several streams and watercourses occur in and around the CBS, the most notable of which is Boundary Creek, which extends through the central and southeast portion of the site. In addition to local surface water resources, the CBS is underlain by a groundwater aquifer that has been designated by the U.S. Environmental Protection Agency as a "sole source aquifer." This groundwater aquifer is the primary, if not sole, source of potable water for the rural communities situated at and near the site. There are no notable surface water resources at or near the ICDS, other

than ephemeral desert washes. Little information is available regarding groundwater in the vicinity of the ICDS, although the Ocotillo-Coyote Wells Sole Source Aquifer is located several miles west of the site.

It is anticipated that development and operation of an airport at the CBS would have moderate surface water quality impacts, based on the location of Boundary Creek in the site footprint. Potential impacts to water quality, the benthic environment, and the general water aesthetics in that drainage area would be greater than potential impacts to water quality at the ICDS location. To the extent that the community in the CBS area relies on surface and groundwater, the potential water quality impacts associated with the CBS could arguably be more critical than impacts at the ICDS. Development at the ICDS would have fewer impacts based on existing conditions of the site area, that is, no stream crossings.

Biological Communities

The evaluation of biological communities, presented in Section 4.10.4 of this document, describes existing vegetation communities and plant and animal species at, and near, each alternative site, and addresses the potential impacts to those resources that could result from the construction and operation of a new airport. The evaluation also discusses, more generally, resources and impacts associated with the off-airport improvements. The evaluation provided in this document is based solely on existing available information, especially from available Geographic Information System (GIS) data, and no field surveys were conducted as part of the analysis. The following summarizes the nature of the biological communities' resources and impacts associated with each alternative site, as well as with the off-airport improvements.

Table ES-7

Overall Summary and Comparison of the Sensitive Biological Resources at Each Alternative Site

	CBS	ICDS
Construction Impacts		
Vegetation Communities	Site has 4,029 acres of chaparral community types that would be lost, including 2954 acres of granitic northern mixed chaparral and 938 acres of red shank chaparral – each of these is either considered rare or has a rare subtype. Site has 124 acres of coast live oak woodland, a high sensitivity community that would be directly and permanently impacted. Site has 19 acres of three wetland/riverine community types that would be lost – all are high sensitivity communities.	Site has 3,968 acres of Sonoran creosote bush scrub land, a moderately sensitive community that would be directly and permanently impacted. This community is well represented throughout its range, and this impact is not considered to be a substantial concern to the health and existence of this vegetation community. However, as much as 23,807 acres could be required to mitigate for this impact, which is entirely within a BLM management area.

	CBS	ICDS
Plants	<p>Native chaparral communities, wetland, and coast live oak communities all harbor a diverse and abundant array of plant species. No federally or state listed plants. Eleven sensitive plants, including 5 moderate sensitive plants with known/high potential to occur, 2 moderate sensitive plants with moderate occurrence potential, 3 low sensitivity with high occurrence potential, and 1 low sensitivity with a moderate potential to occur. Site does not appear to present substantial concerns regarding sensitive plants.</p>	<p>Present ecosystem harbors a unique yet not overly diverse population of plant species. Five sensitive plant species: two with known/high potential and three with moderate or low occurrence potential. Site does not appear to present substantial concerns regarding sensitive plants.</p>
Wildlife	<p>The entire acreage of natural chaparral communities, wetland and riverine communities and coast live oak communities all harbor diverse and abundant populations of wildlife species. Very substantial potential biological impact on the federally endangered Quino checkerspot butterfly. Site could also impact critical corridor for Quino checkerspot. San Diego coast horned lizard, a state species of special concern and MSCP covered species, has a high potential to occur. This species is declining throughout its range, primarily due to loss of habitat in introduction of invasive exotic animal species. Three additional state species of special concern have high potential to occur on-site, along with three state special concern species with moderate potential. In sum, the site could present substantial impacts to sensitive wildlife species.</p>	<p>The entire acreage of Sonoran creosote bush scrub hosts a unique and healthy population of wildlife species. No federally listed animals. One state threatened species has a moderate potential to occur. One BLM sensitive species and state Species of Concern – flat-tailed horned lizard is known to occur and represents a particular concern because the site lies within a BLM-designated ACEC and Flat-tailed Horned Lizard Management Area, both of which were specifically established to protect the flat-tailed horned lizard. This coincidence could increase mitigation ratios to as high as 6:1.</p>
Operation Impacts	<p>The introduction of exotic species, noise, light, and air strikes could all have negative impacts on plant and animal species, especially on the federally endangered Quino checkerspot and federal/state species of special concern: the San Diego coast horned lizard.</p>	<p>The introduction of exotic species, noise, light, and air strikes could all have negative impacts on wildlife species, especially on nine flying sensitive species and the flat-tailed horned lizard.</p>
Off-Airport Impacts	<p>Substantial and diverse impacts would be produced by the construction and operation of a transit and/or highway connection to the CBS and all necessary utility connections to the site.</p>	<p>Substantial and diverse impacts would be produced by the construction and operation of a transit and/or highway connection to the ICDS and all necessary utility connections to the site.</p>

Source: EDAW, 2005.

In general, development at the CBS would result in greater impacts to highly sensitive habitats than at the ICDS where no highly sensitive habitats occur. Development at the ICDS would result in greater impacts to moderately sensitive habitats than at the CBS. With regard to sensitive species,

development at the CBS would result in greater impacts to highly sensitive animal species than at the ICDS, based on available databases. The effect of development on animal species with moderate sensitivity would be greater at the ICDS than at the CBS. Based on available databases, only plant species with moderate sensitivity are either known to occur at the sites, or have a high potential to occur. The effect of development on plant species with moderate sensitivity would be greater at the CBS than at the ICDS. Additionally, potential impacts pertaining to endangered and threatened species, as described below, is another concern related to biological communities.

Endangered and Threatened Species

The evaluation of endangered and threatened species, as presented in **Section 4.10.5** of this document, addresses federally and state-listed threatened or endangered plant and wildlife species known to occur, or having the potential to occur, within each alternative site.

Three threatened or endangered species and one California species of special concern managed by the BLM are known to occur or are expected to occur within the CBS and ICDS alternatives. These species are the Quino checkerspot butterfly (federally-listed endangered species) and Peninsular bighorn sheep (state- and federally-listed endangered species) for the CBS, and the Swainson's hawk (state-listed threatened species) and flat-tailed horned lizard (species of special concern that was proposed in 1993 to be federally-listed, but, based on finalization of a rangewise management strategy-conservation agreement among federal, state, and local agencies, was removed from the proposed listing) for the ICDS.

Potential direct impacts to Quino checkerspot butterfly include habitat loss, direct mortality, and habitat fragmentation. Potential impacts to Peninsular bighorn sheep include increased levels of human activity and overhead aircraft noise. Indirect impacts such as construction-generated lighting, dust, and pollutants may affect both species. The potential impacts to the Quino checkerspot butterfly and Peninsular bighorn sheep are expected to be considered substantial by the resource agencies. Mitigation for impacts to these two species would be determined through consultation with the resource agencies.

Potential direct impacts to flat-tailed horned lizard include habitat loss, direct mortality, habitat fragmentation, and various indirect impacts such as construction-generated lighting, dust, and pollutants. Also, substantial impacts to the Swainson's hawk may occur (i.e., loss of foraging habitat, impacts to prey base). Potential impacts to both species are expected to be considered substantial by the resource agencies. Mitigation for impacts to these two species would be determined through consultation with the resource agencies.

A comparison of the two airport alternatives is difficult, due to the high sensitivity of the two species at each site. Although Quino checkerspot butterfly is not known to occur directly within the boundaries of the CBS, there is a high potential for this species to occur on and adjacent to the site. Although there is a low potential for Peninsular bighorn sheep to occur on-site, there is high likelihood this species would be directly impacted from operation of the airport, due to overhead aircraft noise, as well as indirect impacts such as introduction of exotic species. Additionally, the ICDS is located entirely within an important BLM-designated management area for the flat-tailed horned lizard species, found throughout and adjacent to the ICDS footprint, and development of this site may reopen discussions with the resource agencies to list this species. Mitigation for listed species at each site may be costly and have low feasibility, with limited suitable habitats available for compensation and severely restricted geographical and topographical ranges due to species preferences. The same is true for those species known to occur within the ICDS. Development of an

airport for either site will result in direct and indirect impacts from construction and operation that are expected to be considered substantial by the resource agencies.

Wetlands

The analysis of wetlands issues, presented in Section 4.10.6 of this document, includes an evaluation of the wetland resources within each alternative site, and the potential impacts to these resources that would result from development of an airport. Also evaluated, in a more general manner, are wetland resources coincident with off-airport improvements. The analysis is based on review of existing available information, and field surveys and wetlands delineations were not completed as part of this study.

The following provides a summary comparison of the wetlands and water resources at each alternative site (based on available information). Any impacts to wetlands and waters at the airport sites would be considered substantial by the resource agencies. The potential impacts at the CBS would be considered very substantial.

Table ES-8

Overall Summary and Comparison of Wetlands and Waters at Each Alternative Site

Impacts	CBS	ICDS
Construction	A total of 19 acres of three types of wetlands habitats would be lost – all are high sensitivity communities. Although considered an upland vegetation community, the 124 acres of coast live oak woodland within this site have the potential to include jurisdictional wetlands or waters. If present, these resources would be directly and permanently impacted.	Jurisdictional wetlands and waters have the potential to occur at this site, particularly in Pinto Wash. If present, these resources would be directly and permanently impacted.
Operational	The introduction of exotic species into adjacent wetlands would be considered substantial. Adverse impacts to surrounding water quality may potentially occur. Adverse impacts to wetland habitat species composition, function, and productivity may result from deposition of pollutants.	The introduction of exotic species into adjacent wetlands would be considered substantial. Adverse impacts to surrounding water quality may potentially occur. Adverse impacts to wetland habitat species composition, function, and productivity may result from deposition of pollutants.
Off-Airport Transportation and Utility System	Substantial impacts to wetlands and waters would occur from the construction and operation of a transit and/or highway connection to the CBS and all necessary utility connections to the site.	Substantial impacts to wetlands and waters would occur from the construction and operation of a transit and/or highway connection to the ICDS and all necessary utility connections to the site.

Source: EDAW, 2005.

Floodplains

The analysis of floodplain issues, as addressed in Section 4.10.7 of this document, addresses existing floodplains at and near the alternative sites in terms of potential physical environmental effects or

impacts (e.g., flooding and drainage/runoff) associated with future improvements and operations at each alternative airport site, and with associated off-airport improvements. Floodplains are federally defined as "the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year (i.e., the area that would be inundated by a flood event having a statistical likelihood of occurring once in 100 years - otherwise known as a "100-year flood").

No known 100-year floodplains are located within the CBS footprint and, therefore, no impact is anticipated. The Pinto Wash and the Yuha Wash are located within the ICDS footprint and a total of approximately 165 acres of 100-year floodplain area would be impacted by development of a new international airport at the subject site. As noted above in the summary of hydrology issues, the engineering, design, and construction of an airport at the ICDS would take into account, and provide solutions for, the existing 100-year floodplain.

Historical, Architectural, Archaeological, Paleontological, and Cultural Resources

Issues pertaining to historical, architectural, archaeological, paleontological, and cultural resources, as presented in Section 4.10.8 of this document, are addressed relative to impacts associated with the construction and operation of a new international airport at each alternative site, as well as from related off-airport improvements. The characterization of resources found at each of the two alternative sites is based on a review of existing literature and records specific to each site, and a very limited visit to each site. The analysis of the resources and impacts associated with the off-airport improvements is much more generalized than the evaluation of the alternative sites.

Detailed resource-specific information about the alternative sites is limited, since only 9 percent of the CBS and 13 percent of the ICDS has been surveyed. Many of these surveys are more than 10 years old and some are not considered comprehensive.

Based on records searches, published site geology, and the results of other archival literature and museum searches, all of the sites would potentially have significant impacts to resources. The CBS has less potential for adverse impacts on paleontological resources of the alternatives. Based on the site geology and proximity to recorded fossil localities, the ICDS has a high potential for adverse impacts on paleontological resources. The CBS and ICDS have a low probability of substantial adverse impacts to architectural resources. The CBS ranks as the site with more potential to impact a Native American sacred site. Both the CBS and ICDS rank as having a high potential for impacts to archaeological resources.

There is no way to determine which of the alternatives contains more resources, because comprehensive resource inventories do not exist. Also, it is likely, given the alluvial deposits at these sites that there may be buried resources. Therefore, even with surveys it may not be possible to ascertain the locations of all the archaeological deposits or fossils, or their relative abundances prior to construction. Potentially significant resources would require evaluation, and site-specific mitigation measures would need to be identified in an effort to sufficiently reduce impacts. However, regardless of the alternative selected, pre-construction architectural, archaeological, and paleontological walk-over surveys would need to be conducted.

Coastal Zone Management and Coast Barriers

The CBS and ICDS are inland and well outside the coastal zone and therefore are not subject to the California Coastal Act.

Prime and Unique Farmland

The evaluation of prime and unique farmlands, as presented in Section 4.10.10 of this document, addresses the potential for development of an international airport to result in the loss of important farmland, which includes land designated as Prime Farmland or Unique Farmland by the state Department of Conservation, Farmland Mapping and Monitoring Program (FMMP) or the federal Natural Resources Conservation Service, and also farmland that is under a Williamson Act contract (i.e., an agreement between a landowner and the state that certain lands will remain in agricultural use in exchange for a lower property tax assessment). The evaluation also includes a more general evaluation of loss of important farmlands that could result from off-airport improvements.

No impacts to important farmland, or agricultural contract lands or preserves, would occur at either of the alternative sites. A small loss of FMMP-designated Grazing Land would occur if the CBS were selected, but this impact would not be considered substantial. Agricultural uses adjacent to the alternative sites would not be precluded by airport facilities and operations at the sites; therefore, no indirect impacts would occur to nearby agricultural resources. However, nearby agricultural activities that could have effects that are detrimental to aviation safety (i.e., generation of dust or attraction of birds) would need to be avoided near the airport site. In addition, the off-site improvements associated with either site would impact scattered areas of land under Williamson Act Protection, as well as designated Grazing Land and various categories of Important Farmlands.

Light Emissions

The evaluation of issues related to light emissions, as presented in Section 4.10.11 of this document, assesses the potential future changes in light emissions sources and the related impacts to sensitive receptors associated with construction and operation of an international airport at either alternative site, as well as impacts associated with off-airport improvements.

The proposed airport facilities would result in substantial adverse light emission impacts at both of the alternative sites, given that both sites are situated in a largely undeveloped area with dark night skies and very few sources of light. In addition to adverse impacts to the local night sky, it is anticipated that adverse impacts would occur in more distant areas relative to existing observatories, such as at Mount Laguna and Palomar, that conduct astronomical research looking toward eastern skies (i.e., toward the locations of the alternatives). Given that the ICDS is located farther east than the CBS, potential impacts to these observatories would be less from development of the ICDS than from development of the CBS. Impacts associated with increases in local and/or regional ambient light levels would remain adverse, even with mitigation, at both alternatives.

Visual Impacts

The evaluation of issues related to visual impacts, presented in Section 4.10.12 of this document, describes the existing visual conditions at each alternative and analyzes the potential impacts to visual resources that could result from construction and operation of an international airport and associated improvements at the two alternatives. Also addressed, more generally, are visual impacts related to off-airport improvements.

Given the size and nature of the proposed facilities, and the extent of landform alteration associated with development of the CBS, it is anticipated that substantial visual impacts would occur relative to both the foreground viewing area (i.e., within 0.25 mile of the site) and the middle-ground viewing area (i.e., within 0.25 mile to 3 miles of the site), and, to some degree, the far-ground viewing area (i.e., greater than 3 miles away). The existing appearance of the site, characterized by diverse terrain, natural vegetation, rock outcroppings, and rural development, would be replaced with a large flat

area improved with many large structures of a nature incongruent with the natural/rural setting that surrounds the site. This change in visual character would be readily apparent in much of the foreground and middle-ground viewing areas. In addition to the direct visual impacts associated with changes to the physical character and appearance of the site, aircraft operations at the airport, specifically aircraft take-offs and landings, would be visible for many miles, even if the airport itself is not visible. In general, operation of a new international airport at the CBS would have substantial visual impacts for miles around.

The proposed ICDS would introduce an airport and related facilities to a sparsely populated and undeveloped area. Based on the absence of any notable viewing groups located within 0.25 miles of the ICDS, other than occasional use of the surrounding desert area by off-road recreational motorists, the conversion of the ICDS from vacant land to an international airport would not have substantial visual impacts within the foreground viewing area. In the middle-ground viewing area, which extends out approximately three miles from the ICDS boundary, motorists driving along SR 98, located south of the site, would notice a substantial change in the visual character of the site, both in terms of comparing existing conditions to future (with project) conditions and in terms of the appearance of the airport being considerably different from the surrounding area. Similarly, but perhaps to a lesser degree, motorists driving along I-8, located approximately four miles north of the site would observe a noticeable change in the existing character of the site and in the site's appearance relative to the surrounding area. In addition to motorists on I-8, other viewer groups in the far-ground viewing area could include residences located several miles east of the ICDS. While direct view impacts associated with the visibility of the airport facility may be limited in the far-ground viewing area by distance, intervening structures and topography, aircraft operations, particularly take-offs and landings, would be visible for many miles.

DOT Section 4(F) (Section 303)

The evaluation of issues related to Section 4(f) of the federal Department of Transportation Act (DOT), presented in Section 4.11 of this document, addresses the potential for construction and operation of an international airport at either alternative site to result in a "use" of public parks and recreation lands, wildlife and waterfowl refuges, and any historic sites. The evaluation also assesses whether the proposed airport development would result in the conversion of public park and recreation lands funded through the U.S. Department of the Interior Land and Water Conservation Fund Act of 1965 (LWCF Act).

Overall, impacts to Section 4(f) resources are likely unavoidable due to the extent of the impact area associated with each site. Avoidance of Section 4(f) resources would require changes in the site boundaries and alignment. The Secretary of Transportation would be required to cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture in developing the project including measures to maintain or enhance the natural beauty of the lands the project traverses.

In comparison, it is likely that impacts to Section 4(f) resources on the ICDS would be unavoidable due to the relationship with ACEC BLM lands. Consultation would be required and an agreement would need to be formulated to allow the project to be permitted. For the CBS, it is possible that Section 4(f) impacts could be substantially minimized if the project boundaries and public uses could be altered through the development of the project. For this reason, the CBS would be preferred over the ICDS, with respect to Section 4(f) resources.

Energy Supply and Natural Resources Summary

The evaluation of issues related to energy supply and natural resources, presented in Section 4.12 of this document, addresses electricity, natural gas, and other fossil fuel consumption associated with construction and operation of an international airport at either alternative, and provides a more general assessment of issues related to the off-airport improvements. Also addressed is the potential for development of either alternative site to restrict access to natural resources, including mineral, timber, and petroleum resources. The use of local aggregate resources for the construction of airport facilities and off-airport improvements is also evaluated to determine if adequate resources would be available to meet the projected demands. The analysis found that there is no difference in the on-airport operations-related energy consumption for CBS or ICDS. The statistics that separate the two sites are related to the ground access and the energy consumption associated with the total vehicle miles traveled (VMT), and as related to construction equipment energy consumption. The ICDS alternative has a higher VMT than the CBS and the CBS would require a greater amount of fuel for construction equipment operations.

Solid and Hazardous Waste Handling

The evaluation of issues related to solid and hazardous waste handling, presented in Section 4.13 of this document, addresses impacts related to solid and hazardous materials/waste use, generation, storage, transportation, and disposal associated with the construction and operation of an international airport at either alternative, and as related to off-airport improvements. The analysis also describes facilities or properties on site or in the vicinity of each alternative site that have been documented by one or more of the regulatory agencies as having been impacted by the release of hazardous substances, which have the potential to affect development of an international airport at either of the alternative sites.

The proposed alternatives were compared not only with each other, but also individually in terms of overall feasibility and likelihood of potential impacts. Potential hazardous waste impacts generally were found to result from or during construction activities, while the majority of solid waste impacts would result from longer-term operational activities.

Given the fact that operational activities for an airport would result in the need for transport and disposal of solid waste regardless of the airport location, solid waste impacts resulting from routine, operational activities were considered to be relatively constant for each of the sites. Each alternative is feasible if the appropriate compliance with applicable federal, state, and local regulations related to solid and hazardous waste management occurs; however, there is the potential that the ICDS alternative would result in a greater potential for hazardous waste impacts during construction activities compared to the CBS alternative. This is due to potential unexploded ordnance (UXO) issues at the ICDS alternative. Portions of the ICDS and the ICDS access road are within the boundaries of both the former Camp Seeley Ordnance Proving Ground and the Camp Seeley Ordnance Training Center. The presence or absence of UXO at the ICDS cannot be confirmed based on existing information, and a more definitive assessment of the potential for UXO impacts resulting from development of the ICDS would require further analysis and coordination with military officials. This potential is, however, unique to the ICDS and a relevant consideration in comparing the two alternatives.

Land Use and Plan Consistency

The evaluation of issues related to land use and land use plan consistency, presented in Section 4.14 of this document, examines the existing land uses at each of the alternatives, and the notable regulations, plans, and policies related to land use. It identifies the extent to which construction and

operation of an international airport and associated improvements at either of the alternative sites and their environs could result in land use incompatibilities. This includes incompatibilities with adjacent sensitive land uses due to aircraft noise, as well as any inconsistencies with applicable federal, state, and local regulations, plans, and policies.

Implementation of either the CBS or the ICDS alternative, and the off-airport improvements associated with each alternative, would result in land use impacts, including inconsistencies with adopted land use plans and policies. Because the CBS is located in closer proximity to sensitive uses, such as existing residential development, the CBS alternative would have greater impacts on on-airport and airport-adjacent areas, such as noise impacts and displacement of residential and public service land uses. The ICDS alternative is more remote and therefore, would have less impact on neighboring uses.

The ICDS is located within a highly sensitive area in terms of historic/paleontological resources and biotic resources, based on the fact that it is located within the California Desert Conservation Area (CDCA) - Yuha Basin Area of Critical Environmental Concern (ACEC), as so designated by the U.S. Department of Interior, Bureau of Land Management (BLM). Development of a new international airport at the ACEC would be inconsistent with existing land use controls and protections afforded through the ACEC designation. The BLM would need to amend the existing management plan for this portion of the CDCA, including the need to address the existing ACEC designation for the area. In order to do so, the BLM would need to prepare an environmental impact statement, conduct a public input/hearing process, and make certain findings relative to whether the necessary revisions to the management plan are in the public's interest.

Both the CBS and the ICDS appear to be incompatible with regional transportation and smart growth land use documents that recommend intensive uses such as airports to be located within, or in close proximity to urban areas, where housing, jobs, roads, utilities, and other types of infrastructure are in place. By developing an airport and its associated off-airport improvements, both the CBS and the ICDS could be characterized by these land use plans as contributing to sprawl, resulting in the loss of rural resources such as open space, sensitive habitat, and prime agricultural land.

Both the CBS and the ICDS alternatives would require general plan amendments and zone changes in order to provide consistency with local and regional land use regulations. They would both need to comply with federal and state land use policy documents, especially those that deal with safety and compatibility criteria in order to be able to successfully implement an airport plan. The only federal-level document that would need to be amended is the BLM CDCA management plan, as indicated above.

Social Impacts:

Community Disruption

The evaluation of issues related to community disruption, presented in Section 4.15.1 of this document, addresses the potential for development of either of the two site alternatives, and the associated off-airport improvements, to disrupt existing communities. The community disruption analysis takes into consideration many types of impacts including property acquisition, displacement of existing uses, effects on access, additional traffic and noise, visual/aesthetic changes, and other changes that may affect the overall character and functioning of the local community.

Implementation of either the CBS alternative or the ICDS alternative, and the associated off-airport improvements, would result in community disruption impacts. The impacts associated with the construction and operation of the on-airport improvements for the CBS alternative would be

substantial based on the proximity of the rural community of Boulevard. The substantial community disruption impacts associated with the CBS include direct and indirect impacts from both construction and operation of the airport. Direct impacts include dust, noise, nighttime lighting, and changes in the visual aesthetic character of local (Boulevard) area. Indirect impacts include the likelihood of new development and growth occurring in the area as a result of the need to accommodate the large construction workforce and airport operations workforce, and to provide construction-related and airport-related support businesses and services. With this new development would come increased traffic, noise, air pollutant emissions, light emissions, and greater demands on public services and utilities.

By comparison, direct impacts associated with community disruption for the ICDS alternative would be minimal, as there are no communities near the site. Indirect impacts associated with the need to accommodate workers and businesses associated with the construction and operation of an airport at the ICDS would include new development likely to occur in the general vicinity of El Centro. To the extent that the El Centro area is much more developed than the Boulevard area, it is possible that the changes in community character due to new development and growth would be less pronounced under the ICDS alternative than the CBS alternative.

With regard to community disruption impacts resulting from the construction and operation of the off-airport improvements associated with each alternative, both alternatives would have generally the same impacts related to HSTS improvements occurring within urbanized portions of western San Diego County, and also impacting some rural communities near the central and eastern portions of the HSTS alignments. In general, the impacts associated with Alignments A and B under the CBS alternative would not be substantially different from those associated with Alignments A, B, and D under the ICDS. Alignment C, under the ICDS alternative would likely have the fewest community disruption impacts of all the alignments because it involves the least amount of developed areas.

Community disruption impacts associated with the construction and operation of highway improvements would be minimal under either alternative.

Community disruption impacts associated with the construction and operation of utility systems improvements would be greater under the CBS alternative than under the ICDS alternative, as the ICDS requires much less in the way of improvements and those would occur primarily in undeveloped areas that are not near existing communities.

In general, community disruption impacts would be greater for the CBS alternative than the ICDS alternative.

Induced Socio-Economic Impacts

The evaluation of issues related to induced socio-economic impacts, presented in Section 4.15.2 of this document, addresses the potential for development of a new international airport at either the CBS or ICDS, and associated off-airport infrastructure, to foster economic and population growth, which would result in the construction of new housing and other land use development. Such project-induced growth could, in turn, result in additional impacts to the environment beyond those directly attributable to the development of the airport and associated infrastructure. In addition to the potential for construction and operation of a new international airport to induce socio-economic growth, this section also addresses the potential for the related off-airport improvements, such as transportation system improvements and utility system improvements, to result in induced growth, to the extent that they remove existing obstacles to growth (i.e., would improve accessibility to, and basic utilities for, remote undeveloped areas).

The construction and operation of an international airport, and the associated off-airport improvements, for either the CBS alternative or the ICDS alternative, pose the potential for growth inducement in the nearby areas. Implementation of either alternative would require a substantial construction work force (over 800 workers) that would be at the site for many years. Based on the size of the required work force and the locations of both alternatives being distant from highly populated, urbanized areas, it is likely that the required work force would be drawn from areas throughout the state, and possibly from out of state, and that workers would seek local housing and services. The existing rural nature of the area around the CBS is not well-suited to accommodate such a demand, and it is likely that pressure to develop additional lodging/housing and related commercial uses would occur in and around the Boulevard area. In addition to such growth related to accommodating the work force, there would likely be demands for construction-related businesses, such as materials fabricators, supply shops, equipment sales/rentals/repairs, and the like. The ability to develop any substantial amount of new residential or non-residential uses in the general area of the CBS would be constrained by several factors including, but not limited to, existing and proposed land use designations, the area's reliance on groundwater (as related to both the ability to obtain potable water and the ability to provide wastewater disposal using septic systems), and a relatively limited network of local roadways.

Relative to the ICDS, the proximity of this site to existing urban development in the El Centro area, approximately 15 to 20 miles away, offers a greater potential for more of the work force to be drawn from, and/or be accommodated at, an area generally close by. There would still be, however, some growth inducement in nearby areas, as the entirety of the construction-related demands would not likely be met by existing development. The pressure for new development nearby would probably be less than that of the CBS, and the provision of additional lodging/housing and businesses due to airport construction would probably occur as in-fill within the generally populated area that extends from the southeast side of the Salton Sea south to the United States/Mexico border.

The new development and growth associated with each alternative could have positive impacts on the local economy by providing new jobs, business opportunities, and property and sales tax revenues. Potential adverse impacts associated with such new development could include increased traffic, noise, air pollutant emissions, ground disturbance including removal of vegetation, and increased demands on public services and utilities. For the CBS alternative, the increased demands on groundwater would be an adverse impact of particular note for that alternative. For the ICDS, the likely conversion of existing farmland to development uses would be an adverse impact of particular note for that alternative.

There is the potential for growth inducing impacts from operation of the airport, both in terms of accommodating approximately 9,000 workers associated with full operation of the airport and in terms of accommodating the types of new businesses typically attracted to airports. The nature and implications of such impacts are generally similar to those described above for construction-related growth, but at a larger scale.

Should a high-speed transit system be developed in conjunction with either alternative, the potential from growth inducement associated with accommodating the workers and activities, both as related to construction and to operations, could be reduced. The provision of such transportation could reduce the pressure to accommodate workers and businesses associated with the airport locally. This would likely be greater for the CBS than for the ICDS, due to relative location of each alternative site to nearby populated areas.

There is the potential for growth-inducing impacts to result from the off-airport improvements, such as the high-speed transit system and the utility system improvements associated with the CBS

alternative. The improved accessibility between the population and employment centroid of San Diego County and CBS could, itself, attract more development in eastern San Diego County, and the provision of utility systems improvements, especially potable water, could reduce existing impediments to new development in the area. The off-airport improvements associated with the ICDS alternative do not pose the same growth inducement potential as the CBS alternative, based on the fact that accessibility between the urban core of Imperial County is not as critical, given that there are relatively populated areas within 15 to 20 miles of the ICDS, and there is not the same need for utility system improvements at the ICDS.

Housing Impacts

The evaluation of housing impacts, presented in Section 4.15.3 of this document, addresses the potential impacts on housing associated with construction and operation of a new international airport and associated off-site infrastructure improvements at either the CBS or ICDS. On-site impacts addressed include the need for acquisition of existing homes and relocation of displaced residents. The analysis discusses the number of homes to be acquired, the estimated number of residents that would be displaced, and the availability of replacement housing. Also addressed are potential incompatibilities from operation of an international airport with existing housing in the vicinity of each site and the related need for noise abatement measures. Potential impacts on existing housing from development of off-site improvements to transit and utility lines are also addressed.

Both airport sites are located in rural areas, thereby limiting potential impacts on existing housing. Development of the CBS site would, however, have a greater impact than that of the ICDS alternative since it would necessitate the acquisition of 77 existing housing units and require the relocation of approximately 225 residents.

The CBS also has 37 housing units located within the noise impact area (defined as the 65 db CNEL noise contour) that extends outside of the airport site boundary. These housing units would require noise abatement measures to be taken to eliminate or reduce this incompatible land use. There are no housing units within the noise impact area of the ICDS.

For both airport sites, the undeveloped land in the vicinity would allow the establishment of land use controls to provide for development of compatible uses. This opportunity is greatest with the ICDS as there are fewer developed parcels in the vicinity of the site.

In conclusion, development of an international airport at the CBS would have greater on-site impacts to housing than development at the ICDS, and would also result in a larger number of homes located within the noise impact area. While off-site transit improvements for each site would have similar impacts on housing, off-site utility improvements would likely have a greater impact on housing for the CBS as well. Opportunities are available for both sites to guide future development in the vicinity, thereby ensuring that new housing is sited in locations that are compatible with an airport.

Mitigation

The overall mitigation strategy associated with the construction and operation of an international airport at either the CBS or ICDS is provided in Section 4.16 of this document. A variety of mitigation measures has been identified that could reduce the environmental impacts associated with development of an international airport at the alternative sites under consideration. Identified mitigation measures would serve to reduce potential impacts associated with construction and operation of both on-site and off-site improvements at the CBS or ICDS. The mitigation strategy includes both social mitigation measures, which would mitigate effects such as noise, acquisition and relocation, land use, and other effects to the human environment, and physical mitigation measures,

which would address impacts to the physical environment, such as biological communities, wetlands, threatened and endangered species, air quality, and others.

Section 4.16 of this document also provides an order-of-magnitude estimate of the costs associated with implementation of these measures. Costs are provided as total costs where possible and as unit costs if total costs cannot be quantified at this time.

Most of the mitigation measures would apply to both the CBS and the ICDS, although some measures are only applicable to one alternative. Even where the measures would be the same, the associated costs often vary substantially depending upon the alternative. Key differences are summarized below.

Both sites would require substantial mitigation of off-airport ground access impacts to I-8, including the addition of one to three lanes, as well as related improvements such as bridge widenings, soundwalls, median improvements, and interchange modifications. Costs associated with ground access mitigation would be approximately 40 percent higher with the ICDS than with CBS due to the greater length of I-8 that would require improvement.

The CBS and ICDS would both require substantial mitigation relating to air quality impacts. However, construction-related air quality mitigation would be more extensive and costly at the CBS due to the substantial grading required, whereas operational ground transportation-related air quality mitigation would be more costly at the ICDS due to the greater travel distances.

Both alternatives would require substantial habitat-based mitigation to address impacts to biological communities, endangered and threatened species, and wetlands resulting from implementation of on-airport improvements. Because of its location within a BLM-designated Area of Critical Environmental Concern (ACEC) and Flat-tailed Horned Lizard Management Area, habitat-based mitigation costs associated with the ICDS could be as much as four times higher than those associated with the CBS.

Potential impacts to historic, architectural, archaeological, and paleontological resources would be similar at the two sites. However, because of the greater likelihood of encountering resources at the CBS, and the presence of a Native American sacred site, mitigation costs could be close to double those associated with the ICDS.

The CBS would require mitigation relating to the relocation of residents, whereas the ICDS would not involve any relocation of residents. Similarly, the CBS would require soundproofing of 37 residential units surrounding the proposed airport, whereas the ICDS would not require soundproofing. Due to the presence of granitic materials on the CBS site, an on-site rock crushing facility is recommended to reduce traffic and air quality impacts associated with haul trips. Such a facility would not be required for the ICDS. Both alternatives would require an on-site materials recovery facility to increase solid waste reuse and recycling.

As a result of the differences identified above, total costs for environmental mitigation would differ substantially. Costs at the CBS could range from \$1.95 billion to \$3.34 billion. Costs at the ICDS could be twice as high, ranging from \$3.31 billion to \$7.36 billion.

Implementation Requirements

A description of regulatory processes and related actions that may be required by agencies or stakeholders for each alternative is provided in Section 4.17 of this document. This section also identifies actions to be taken by the project proponent that require approval and/or review by other agencies and stakeholders. Most federal and state requirements, as well as some of the regional government requirements, would apply to both the CBS and the ICDS. Some regional or local

actions, while similar for both alternatives, would require review/approvals from different agencies. For example, local action would fall under the jurisdiction of San Diego County for the CBS, and under Imperial County for the ICDS. At the regional level, the sites fall under different Air Quality Management Districts and different Airport Land Use Commissions. These differences in local or regional regulatory agencies are not anticipated to result in a substantial difference in the associated regulatory requirements.

There are, however, several notable differences in the regulatory requirements for each site. Some of the differences between the two sites result from the fact that some regulatory requirements are only applicable to one of the two sites, such as those pertaining to floodplains that only apply to the ICDS. Alternatively, in some cases the same regulatory requirements apply to both sites, however the compliance or approval process would be more complex for one site due to its specific characteristics. For example, both sites would be required to provide for compatible uses in proximity to the airport, but as there is more existing development near the CBS, this process would likely be more complex than with the ICDS.

At this level of planning, it is unclear if certain regulatory processes apply and this makes it difficult to determine the complexity of the processes for the alternative sites. Two notable examples pertain to the ICDS. First, if unexploded ordnance is found on-site, a UXO assessment, monitoring or removal program would need to be developed, resulting in a substantially more complicated and time intensive regulatory process for the ICDS in terms of solid/hazardous waste handling. If UXO assessment, monitoring, or removal program is not required, the solid/hazardous waste handling regulatory processing time would be similar for both sites. Secondly, if surveys determine that jurisdictional wetlands and waters occur at the ICDS, it would greatly increase the challenges of obtaining the required permits for that alternative.

At this level of planning, a determination cannot be made as to which alternative would have a more complex regulatory process in regards to biological and cultural resources. For both, site surveys would be needed to determine the extent and/or type of resources located on-site. Regarding biological resources, sensitive species are known to occur, or potentially occur, at both of the sites. Depending on the specific resources identified on-site, each site would have its own specific challenges that could present obstacles to regulatory compliance. For cultural resources, each site has known cultural resources and the potential for more to be present. However, it is not known which alternative site has a greater number and/or higher integrity of cultural resources, making it difficult to compare at this level of planning.

In summary, the degree of complexity and the number of potential obstacles to obtaining outside agency approvals would be greater for the ICDS than the CBS. This is largely given the fact that the ICDS is owned by BLM and designated as an ACEC, with the most challenging issues being related to acquisition of the property, amending the CDCA, the resource agency permitting process and associated mitigation requirements. Therefore, while regulatory complexities exist for both sites, the ICDS likely presents greater challenges and more potential obstacles.

Costs

The construction cost estimates developed for this study, presented in Section 4.18 of this document, identify, at a planning level order of magnitude, construction costs for development of an international airport at the CBS and ICDS and associated off-site improvements, divided into on-airport and off-airport facilities. On-airport costs include the construction of all facilities required at an international airport within the boundaries of the airport property, whereas the off-airport costs are for construction located outside the airport property. The on-airport costs include earthwork, airport

facilities – airside, terminal, access and parking, cargo, general aviation and ancillary/support facilities, ground access, utility, and land acquisition costs. The off-airport costs estimated for this analysis include the High-Speed Transit System (HSTS) and the utilities associated with each site. The roadway improvement costs are addressed in Section 4.16 of this document and summarized above under the heading "Mitigation."

The estimated construction costs represent the construction costs for known project elements at this point in time. Items specifically excluded from the estimated construction costs include:

- Escalation Costs – All construction cost estimates are in 2005 dollars. It does not include escalation that is likely to be between 3 and 4% for 10 to 15 years compounded annually. The construction period for a project of this scope is likely to be 10 to 15 years, with some years prior to construction for environmental processing and permitting. The increase in the construction costs due to annual inflation rates is not included.
- Environmental Mitigation - The costs associated with environmental mitigation is not included in this analysis. Environmental mitigation costs associated with the development of the CBS and ICDS are discussed in Section 4.16 and summarized above under the heading "Mitigation."
- Off-Airport Land Acquisition - To construct off-airport roadway improvements, the HSTS system, and utilities to serve the airport, land acquisition and/or acquisition of easement rights would be required. These costs are not included.
- Operations and Maintenance Costs – The airport itself, the HSTS, airport roadways, and utilities, both on-and off-airport, require funds on an annual basis for operation and maintenance purposes. These costs are not included.
- Commissioning – The cost of testing and certifying system operations, training operations and maintenance personnel to run the facility and fine-tuning of systems after opening. These costs are not included.
- Financing and Transition Costs – For a project of this magnitude, a detailed financial strategy needs to be developed and a transition plan for all operations and tenants is needed. All of these are likely to carry a cost. These costs are not included.

The total program cost – including on-airport construction, off-airport construction and roadway improvement mitigation – is approximately \$16.7 billion for the CBS compared to \$17.4 billion for the ICDS, as shown in **Table ES-9**. While the total costs for development at both sites is relatively similar, when on-airport costs are compared with off-airport costs, the site requirements for earthwork and HSTS are different. The extensive earthwork at the CBS results in an approximate \$2.6 billion higher cost for that site. On the other hand, the HSTS is \$2.5 billion greater at the ICDS due to the greater distance of that site from the County centroid.

Table ES-9

CBS and ICDS Cost Comparison

Component	Program Costs	
	CBS	ICDS
On-Airport Construction	\$6,403,000,000	\$4,138,000,000
Site Acquisition and Preparation	\$2,775,000,000	\$179,000,000
Land Acquisition	\$50,000,000	\$5,000,000
Earthwork	\$2,725,000,000	\$174,000,000
Airport Facilities	\$3,629,000,000	\$3,959,000,000
Airside	\$543,000,000	\$472,000,000
Terminal	\$1,738,000,000	\$1,738,000,000
Access and Parking	\$627,000,000	\$746,000,000
Cargo	\$141,000,000	\$141,000,000
General Aviation	\$16,000,000	\$16,000,000
Ancillary/Support	\$273,000,000	\$258,000,000
Utilities	\$291,000,000	\$588,000,000
Off-Airport Construction	\$10,295,000,000	\$13,270,000,000
High Speed Transit System	\$8,143,000,000	\$10,667,000,000
Utilities	\$381,000,000	\$112,000,000
Roadway Improvements ^{1/}	\$1,771,000,000	\$2,491,000,000
Total Airport Development Cost^{2/}	\$16,699,000,000	\$17,408,000,000
Potential Environmental Mitigation Cost^{1/,3/}	\$.2 to \$1.6 billion	\$.8 to 4.9 billion

^{1/} Mitigation Costs from Section 4.16.

^{2/} Totals may not add due to rounding.

^{3/} Costs do not include roadway improvement mitigation costs which are included above as part of the off-airport construction costs.

Source: Ricondo & Associates, JacobsenDaniels Associates, CDM, Psomas, Hatch Mott MacDonald, Kimley-Horn Associates, 2005.

Table ES-9 also shows the comparison of potential environmental mitigation cost associated with the two alternative sites. These cost are shown as a range to reflect the high uncertainty associated with these estimates. The cost ranges from \$.2 billion to \$1.6 billion for the CBS to the \$.8 billion to \$4.9 billion for the ICDS.

Summary Comparison of Alternatives

Table ES-10 provides a summary comparison of the CBS and the ICDS relative to the topics described above.

Table ES-10

Summary Comparison of Alternatives

Potential Impact/Issue

Meteorological Conditions

While the CBS has more inclement weather, both sites have meteorological conditions that are favorable for development of the proposed airfield configuration.

Airport Facilities and Operational Efficiency

The design and operational efficiency of the airport facilities proposed to accommodate PAL 30, with the potential for future expansion to PAL 45, would be generally the same for both sites.

Airspace

The development and operation of airfield configuration proposed at the CBS would be generally compatible with the existing regional air traffic operating system. This would not, however, be true for the ICDS, which would have airfield operations that would substantially conflict with, and/or be constrained by, military Special Use Airspace and Mexican airspace.

Ground Access

Airport construction and operations at either site would generate a high number of average daily trips, adversely affecting the existing regional highway system, notably I-8.

The ICDS is approximately 35 miles farther east than the CBS, which means that the traffic impact area between San Diego and the proposed airport would be that much greater for the ICDS than for the CBS.

Utilities

Operation of a new international airport at either site would require substantial extension of utilities to the site, or the provision of utilities on-site including potable water, wastewater, electricity, natural gas, aviation fuel, and communications.

The extension of existing utilities to the CBS would span greater distances than the extension of existing utilities to the ICDS, and, for potable water, would require a much longer "cross-country" extension of a water transmission line.

Land Acquisition/ Relocation

Acquisition of the CBS would encompass 209 parcels, including 77 housing units as well as commercial and agricultural properties. Acquisition of the ICDS would encompass 21 parcels, all undeveloped. As such, acquisition of the CBS would require relocation of existing residential and commercial uses (including commercial agricultural operations).

The ICDS is owned and managed by BLM, and is designated as an Area of Critical Environmental Concern within the California Desert Conservation Area. The federal process for acquiring such land is very complex and could be very difficult to successfully accomplish.

Noise

Noise impacts would result due to an adverse increase in ambient noise levels from aircraft operations. Impacts would be greater for the CBS due to the closer proximity of existing development.

Construction equipment noise impacts would occur in conjunction with development of a new airport at the CBS, based on proximity of existing development.

Construction equipment noise impacts could occur in conjunction with extension of utilities to the airport site.

Construction and operation of the HSTS would result in adverse noise impacts for any of the proposed alignments.

Potential Impact/Issue

Air Quality

Construction would result in substantial, adverse impacts to air quality, due to earthmoving activities and construction equipment, and construction-related vehicle trips.

Excavation activities required for site preparation at the CBS would be substantially greater than those required for the ICDS; hence, the associated air pollutant emissions would also be substantially greater.

Operations would result in substantial, adverse impacts to air quality due to aircraft emissions, vehicle trips, and stationary sources.

Mobile source (i.e., vehicular) emissions for the ICDS would be slightly higher than those of the CBS due to the greater distances traveled to reach the ICDS.

Geological/ Geotechnical/Seismic

Potential geotechnical concerns include loose alluvial soils, and damage to structures due to an earthquake.

Additional potential geotechnical concerns particular to the CBS include undocumented fill and excavation of granitic rock.

Additional potential geotechnical concerns particular to the ICDS include expansive soils.

Hydrology

Construction and operations would alter surface water flows, requiring construction of new drainage facilities, such as storm drains and detention basins.

The ICDS is relatively flat and a portion of the site is located within a floodplain, at which the drainage and flood control improvements required for the ICDS would be more extensive and costly than those required for the CBS.

Water Quality

Construction and operations would introduce pollutants into runoff that could adversely affect water quality.

Several streams and watercourses cross the CBS, which poses the potential for surface water quality impacts to result from the construction and operation of the proposed airport. Additionally, groundwater beneath the CBS is within a designated Sole Source Aquifer, at which potential water quality impacts to groundwater would need to be carefully evaluated pursuant to U.S. EPA requirements.

Biological Communities

Vegetation Communities and Plants

Development of the CBS would result in adverse effects to 4,028 acres of chaparral, 124 acres of coast live oak woodland (high sensitivity), and approximately 19 acres of three high sensitivity wetland/riverine communities. There would be potential effects to 11 sensitive plants, but no federally or state listed plants.

Development of the ICDS would result in adverse effects to 3,968 acres of a moderately sensitive community located within a BLM management area. There would be potential effects to 5 sensitive plants, but no federally or state listed plants.

Wildlife

Development of the CBS would result in a substantial potential impact on federally endangered Quino checkerspot butterfly and Peninsular bighorn sheep (see Endangered and Threatened Species discussion below). Potential impacts to several species of special concern, including San Diego coast horned lizard.

Development of the ICDS would result in adverse effects to flat-tailed horned lizard, a BLM sensitive species and state species of concern, which resides in the BLM-designated Area of Critical Environmental Concern (ACEC) and Flat-tailed Horned Lizard Management Area, which encompasses the site.

Operations

Introduction of exotic species, noise, light, and air strikes could have negative impacts on plant and animal species.

Potential Impact/Issue

Off-Airport Improvements

High likelihood of substantial and adverse impacts by construction of off-site improvements.

Endangered and Threatened Species

Airport Improvements

Construction and operations at the CBS could potentially affect two federally-listed wildlife species known to be present in the vicinity of the CBS, the Quino checkerspot butterfly, a federal endangered species, and the Peninsular bighorn sheep, a federal and state endangered species. Only the Quino checkerspot butterfly is expected to be found on-site. Impacts to the Quino include direct mortality, habitat and dispersal corridor loss, and habitat fragmentation, as well as indirect impacts. Indirect impacts, such as increased levels of human activity and aircraft noise, to Peninsular Bighorn Sheep could occur. Indirect impacts to both species could occur.

Construction and operations at the ICDS could potentially affect one state threatened species, the Swainson's hawk, which is known to occur within the ICDS, and the flat-tailed horned lizard, an animal of regional concern, known to be present in the area. Impacts to the flat-tailed horned lizard could include habitat loss, direct mortality, habitat fragmentation, and indirect impacts. Impacts to Swainson's hawk could include loss of foraging habitat and impacts to prey.

Off-Airport Improvements

Transportation and utility infrastructure requirements associated with both sites could adversely affect up to 40 threatened or endangered plants and animals within San Diego County and up to 18 within Imperial County, including San Diego fairy shrimp, Coastal California gnatcatcher, Quino checkerspot butterfly, Peninsular bighorn sheep, least Bell's vireo.

Wetlands

Airport Improvements

Direct impacts would occur to three highly sensitive riverine/wetland communities totaling 18.6 acres. Coast live oak woodland, located on-site, may also contain jurisdictional wetlands or waters. Indirect impacts could include introduction of exotic species, water quality impacts, and dust which could affect off-site wetland or water features.

Off-Airport Improvements

It is anticipated that transportation and utility infrastructure requirements would have substantial impacts on wetlands and waters.

Floodplains

A 100-year floodplain area would be impacted by development at the ICDS.

Historic, Architectural, Archaeological, Paleontological

Both the CBS and ICDS have a potential to adversely affect historic, archaeological and paleontological resources both on-site and as part of off-site improvements.

Development of an airport at the CBS would adversely affect a Native American sacred site located within the CBS.

Coastal Zone Management

Neither site is located near the coastal zone.

Prime/Unique Farmland

No impacts from airport development at either site would occur to areas designated as Important (Prime/Unique) Farmland, although it is possible that such lands could be affected by the proposed off-airport improvements.

Light Emissions

Construction and operation of both on-site and off-site project components would generate light emissions with the potential to result in impacts to off-site receptors, particularly in rural areas where dark skies are prevalent.

Visual Impacts

Construction and operation of both on-site and off-site project components would result in visual impacts to off-site receptors, including an alteration of the visual character of the rural areas surrounding both sites.

Potential Impact/Issue

DOT Section 4(f)

Impacts to Section 4(f) resources at both the CBS and ICDS are likely to be unavoidable, including potential impacts to public lands, wildlife refuges, parks and recreational facilities and, potentially, historic resources.

Energy Supply and Natural Resources

Construction and operation would require substantial quantities of energy, including electricity, natural gas, gasoline, diesel, and aviation fuel.

Neither site appears to restrict access to mineral resources. However, construction at either site would require substantial quantities of aggregate.

Solid/Hazardous Waste Handling

Construction and operation of an international airport would involve the generation of solid waste. At this level of planning, future solid waste generation has not been quantified. However, due to constraints in landfill capacity in the region, it is anticipated that solid waste generation would result in impacts to landfill capacity.

Construction and operation of an international airport would involve the handling of hazardous materials and the generation of hazardous waste.

In addition, it is anticipated that contaminated soil and/or groundwater would be encountered during construction of the proposed airport, particularly off-site improvements. Insufficient information is available to determine the nature and extent of contaminated soil and/or groundwater that may be encountered during construction.

Land Use

There is a potential for adverse noise impacts due to the construction and operation of an international airport. Impacts would be greater for the CBS due to the closer proximity of existing development.

Development of an international airport at either site would be inconsistent with land use plans, including county general plans and zoning ordinances, and regional comprehensive plans and transportation plans. The ICDS is inconsistent with the BLM California Desert Conservation Area Plan.

Construction and operation of an international airport and off-airport improvements have the potential for land use incompatibilities pertaining to effects from noise, acquisition and relocation, cultural and biological resources.

Community Disruption

Airport Improvements

Construction and operation of an airport at the CBS would disrupt surrounding communities. Construction impacts would include acquisition of 77 housing units, dust and noise impacts on off-site land uses, night lighting, changes in visual character, and indirect effects associated with construction worker population increases. Operational impacts would include noise, air pollution, traffic, light emissions, changes in visual character, and growth inducement impacts.

Construction and operation of an airport at the ICDS would result in few impacts related to community disruption due to the distance of populated areas from the site. Secondary impacts could occur to communities located to the east as a result of induced growth during construction and operations. The most notable operational impacts would be associated with night lighting, which would be noticeable at a distance from the site, and noise impacts, which would be different than current ambient conditions.

Off-Airport Improvements

Construction of off-airport improvements for both alternative sites would result in community disruption impacts, particularly within the western portion of the study area related to construction of the HSTS. Impacts would include dust and other air pollutant emissions, noise, road closures/detours, and lighting impacts. Long-term impacts could also include alteration of surface transportation patterns, physical changes to neighborhoods, and changes to the rural character of communities located in the eastern portion of the study area.

Induced Socio-Economic Impacts

Construction and operation of an international airport and off-airport improvements have the potential for growth inducement in nearby areas.

Potential Impact/Issue

Housing Impacts

Project would require acquisition of 77 housing units at the CBS.

Mitigation

The construction and operation of a new international airport at either site would have substantial impacts requiring extensive array of mitigation measures. This would also be true relative to the off-airport improvements associated with both sites.

Implementation Requirements

The development of a new international airport at either site would require a variety of permits and approvals from numerous agencies, as would the off-airport improvements associated with both sites.

Cost Estimates

The estimated on-airport costs associated with the CBS would be greater than those associated with the ICDS (i.e., \$6.4 billion vs. \$4.1 billion), with much of the cost differential being attributable to site preparation costs.

The estimated off-airport costs associated with the ICDS would be greater than those associated with the CBS (i.e., \$13.3 billion vs. \$10.3 billion), with the most notable cost differential being attributable to the greater length of the HSTS.

Source: Compiled by CDM, 2005.