

Appendix C. Supplement to Alternatives Analysis

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Appendix C provides a summary of alternatives assessed prior to this Environmental Assessment (EA) including candidate sites as assessed in the Site Suitability Assessment [I-8], potential helicopter flight corridor routing options, and the results of the evaluations. In addition, this appendix includes descriptions of the sites included as initial alternatives considered in this EA.

C.1 Summary of the Site Suitability Assessment

As discussed in Chapter II, Alternatives, the Clark County Department of Aviation (CCDOA) identified and assessed 13 candidate sites in the Site Suitability Assessment for the location of a non-urban heliport for commercial Grand Canyon air tour operations in terms of their ability to meet the statutory intent of Nevada Revised Statute Chapter 495, Sections 300-320 (NRS 495) [I-4] and the goals and objectives documented in the Needs Assessment [I-7]. The candidate sites considered in the Site Suitability Assessment included three CCDOA owned and managed public airports and ten facilities not developed for aviation uses in the Las Vegas region; these sites are depicted on **Exhibit C-1**.

C.1.1 Screening Criteria

Candidate sites were evaluated in a three-tier screening process, as described below: preliminary screening criteria, secondary screening criteria, and assessment of feasible sites.

C.1.1.1 Preliminary Screening Criteria

The purpose of this screening was to evaluate the 13 candidate sites in accordance with statutory requirements set forth in NRS 495, CCDOA goals, and generalized facility requirements for an initial occupancy of the Heliport based on the Needs Assessment. Sites that failed to meet the minimum requirements were eliminated.

- **Compliance with NRS 495:** Compliance with the statute such that a new heliport facility (1) is not located at the largest airport in Clark County, (2) is not located near existing residential areas (e.g., existing residences located within one mile of the facility), and (3) reduces overall noise impacts on County residents, among other statutory requirements.
- **Land area:** Evaluated against a 40-acre minimum derived from a study of generalized regional heliport requirements completed as part of this assessment. Sites with potential for expansion (i.e. through land acquisition) were retained for further consideration even if its approximate acreage is less than 40 acres.
- **Drive time from customer base to the site (minutes):** For purposes of this analysis, Caesars Palace was designated as a central location on the Las Vegas Strip. Twenty-two minutes was preferred and 33 minutes was the maximum threshold set. Sites within the “acceptable drive time” of 30 minutes were retained for further evaluation.
- **Surface accessibility:** Ability for air tour operators to access the site within one mile or less from a primary roadway (i.e. interstate freeway or highway) and/or from a secondary roadway with minimal signalized intersections.

Exhibit C-1

Candidate Sites Considered in the Site Suitability Assessment

Exhibit C-1 shows a regional map with locations of both eliminated and retained candidate heliport sites evaluated in the Site Suitability Assessment for a Southern Nevada Regional Heliport.

C.1.1.2 Secondary Screening Criteria

Secondary screening of the remaining candidate sites focused on physical and potential environmental issues carried forward from the preliminary screening were evaluated against the following secondary screening criteria:

- **Controlled airspace:** Potential flight corridor avoids controlled airspace.
- **Adjacent land ownership:** Adjacent land ownership status would not affect development of the site and/or long-term expansion potential of the site for additional heliport-related facilities, if necessary. A site surrounded by City, County, State, or federally owned land is considered more desirable than a candidate site surrounded by privately owned land.
- **Terrain and topography:** Relatively level terrain on the site and in the immediate vicinity.
- **Community issues:** Support and/or opposition to a candidate site.

C.1.1.3 Assessment of Feasible Sites

A relative comparison of the remaining candidate sites was completed using the criteria listed below. The assessment of remaining feasible sites was not used to eliminate candidate sites; rather, the purpose of the analysis in this tier was to determine their overall feasibility and provide information for future considerations.

- **Operational capability:** Assessment of close-in airspace compatibility, and imaginary surface and final approach/take off area (FATO) siting requirements.
- **Flight time considerations:** Ranges in round-trip flight times reflects evaluation of different flight corridor options, when relevant, between a candidate site and the designated Rendezvous Point enroute to Grand Canyon. The Rendezvous Point is a location where flight corridors converge from which Grand Canyon helicopter air tours commence.
- **Existing housing units associated with helicopter overflights:** The number of housing units is the total units within one-mile radius of the candidate site and under one-third mile buffer of potential flight corridors, where provided.
- **Future housing units associated with helicopter overflights:** The number of housing units is the total units within one-mile radius of the candidate site and under one-third mile buffer of potential flight corridors, where provided.
- **Federal and state sensitive lands:** Candidate sites in the vicinity of such lands and beneath potential helicopter flight corridors associated with a candidate site.

C.1.2 Screening Results

Table C-1 provides a summary of the evaluation process and the results of the Site Suitability Assessment. On the basis of that assessment, three sites deemed feasible sites: GoKart/Sloan, Eldorado Valley/Boulder City, and Jean Airport. The GoKart/Sloan site was determined to be the preferred site. McCarran International and Henderson Executive airports failed to the preliminary screening criteria; however, these facilities were retained throughout the screening to provide a basis of comparison against the existing condition for Grand Canyon helicopter air tour operations.

Table C-1
Summary of Site Suitability Assessment

TIER	CRITERIA	CANDIDATE SITES												
		McCarran International Airport ^{1/}	Henderson Executive Airport	Jean Airport	Blue Diamond/ Union Pacific Railroad	Decatur/ Interstate 215	Eldorado Valley/ Boulder City	GoKart/ Sloan	Railroad Pass- Site A	Railroad Pass- Site B	Silverbowl	Silverton	Sunrise Landfill	Three Kids Mine
PRELIMINARY SCREENING	NRS 495	x	x	●	x	x	●	●	x	x	x	x	●	●
	Land Area (acres)	n.e. ^{2/}	● (157) ^{3/}	● (104) ^{3/}	○ (38)	x (34)	● (160)	● (49)	● (160)	○ (37)	● (70)	○ (42)	● (160)	● (44)
	Drive Time (minutes)	n.e. ^{4/}	○ (24.7)	○ (30.6)	● (15.0)	● (7.5)	○ (32.8)	● (17.6)	○ (27.4)	○ (27.4)	○ (25.0)	● (10.0)	x (36.3)	x (36.6)
	Surface Accessibility	n.e. ^{5/}	●	●	●	●	●	●	○	○	○	●	x	x
	Retain for Further Consideration?	yes ^{6/}	yes ^{6/}	yes	no	no	yes	yes	no	no	no	no	no	no
SECONDARY SCREENING	Controlled Airspace	n.e. ^{7/}	○	●			●	●						
	Adjacent Land Ownership	n.e. ^{8/}	○	●			●	●						
	Terrain and Topography	n.e. ^{9/}	●	●			●	●						
	Community Issues ^{10/}	Opposition	Opposition	Opposition			Opposition	Opposition						
	Retain for Further Consideration?	yes ^{6/}	yes ^{6/}	yes			yes	yes						
ASSESSMENT OF FEASIBLE SITES ^{11/}	Operational Capability	Capable	Capable	Capable			Capable	Capable						
	Flight Time Considerations (minutes)	39	39-48	51-52			24	40-41						
	Existing Housing Units Under Corridor	49,670	Up to 14,230	0			0	0						
	Future Housing Units Under Corridor	n.e. ^{12/}	16,953	n.e. ^{12/}			n.e. ^{12/}	Up to 8,605						
	Federal/State Sensitive Land at Site	None	None	None			None	None						
	Federal/State Sensitive Land Under Corridor	Existing	Potential	Potential			Potential	Potential						
IDENTIFIED AS SUITABLE SITE		no	no	yes			yes	preferred						

- Notes:
- = Meets or exceeds criterion
 - = Marginally meets criterion (not preferred)
 - x = Does not meet criterion
 - n.a. = Not applicable
 - n.e. = Not evaluated
 - 1/ = McCarran International Airport was retained throughout the site Suitability Assessment as it represents existing conditions for commercial Grand Canyon helicopter air tour operations.
 - 2/ = A portion of the west side of the airfield at McCarran International Airport is currently used for helicopter air tour operations.
 - 3/ = Land area for Henderson Executive and Jean airports is the total non-airfield land within the boundary of the aviation facility.
 - 4/ = The drive time from the customer base (Caesars Palace) to McCarran International Airport is about 11 minutes. This baseline was used to establish the drive time criterion of the preferred 22 minutes, which is double the existing drive time.
 - 5/ = Major primary roadways, including Interstates 215 and 15, are accessible within one mile of McCarran International Airport.
 - 6/ = Although McCarran International and Henderson Executive Airports do not meet all of the screening criteria, both airports accommodate commercial tour operators and other helicopter operations. The CCDOA may not restrict helicopter operations at any of the airports that it owns and operates as public-use facilities.
 - 7/ = McCarran is served by Class B airspace, which is characterized by large volumes of aircraft activity; helicopter air tour operators should avoid Class B airspace.
 - 8/ = Much of the land adjacent to existing helicopter air tour facilities at McCarran are privately owned and may limit expansion potential of the site in the future, if necessary.
 - 9/ = McCarran is located on level-terrain. Further, helicopter operators currently operate and are based out of McCarran.
 - 10/ = The community expressed opposition to all of the candidate sites in one form or another. Due to lack of overwhelming opposition to any of the candidate sites, all of the sites were retained for further consideration.
 - 11/ = The purpose of the feasibility assessment was to provide evaluation of the remaining candidate sites for future consideration. Therefore, no candidate sites were eliminated as a result of the feasibility assessment.
 - 12/ = Estimates of future housing units associated with helicopter overflights were provided by the City of Henderson; therefore, estimates were not available for McCarran International Airport, Jean Airport, Eldorado Valley/Boulder City candidate sites.

Source: Ricondo & Associates, Inc., *Site Suitability Assessment for a Southern Nevada Regional Heliport*, December 2003
 Prepared by: Ricondo & Associates, Inc., April 2008

C.2 Modification of Existing Helicopter Flight Corridors

The existing helicopter corridors used for Grand Canyon air tours from McCarran International Airport are shown on **Exhibit C-2**. Three generalized corridors are used by Grand Canyon air tour operators at McCarran, as described below:

- **Tropicana:** Helicopters departing on Grand Canyon tours are directed to fly eastbound over Tropicana Avenue.
- **Charleston:** Helicopters returning from Grand Canyon tours are directed to fly westbound over Charleston Boulevard until Fremont Street, then toward the northwest over Fremont Street until west of downtown Las Vegas, then southbound along the Union Pacific Railroad tracks, west of Las Vegas Boulevard (the Las Vegas Strip), then southbound over Industrial Road, remaining west of the Las Vegas Strip.
- **Strip Railroad:** Helicopters departing on Las Vegas Strip tours are directed to fly northbound over Koval Lane, and to fly in an oval pattern around the Las Vegas Strip, returning southbound over the Union Pacific Railroad tracks and over Industrial Road.

These routes were recognized and formally established in the mid- to late-1990s by the Federal Aviation Administration (FAA) through Letters of Agreement with the helicopter air tour operators. Minor modifications to the routes have been made since the late-1990s to the extent possible to reduce overflight noise on residential neighborhoods.¹

Prior to the amendment of Nevada State Legislature amended NRS 495 and completion of planning studies for a non-urban heliport, the CCDOA, in conjunction with the FAA and helicopter operators, assessed multiple corridor options as part of ongoing efforts to reduce helicopter overflights near residential areas. The results of the assessments are documented in **Table C-2**.

The federal government, through the FAA, has exclusive jurisdiction over airspace and therefore is responsible, along with the pilot-in-command, for controlling the movement of aircraft. FAA Air Traffic Control (ATC) dictates helicopter operations in controlled airspace surrounding airports but does not control the movement of helicopters in uncontrolled airspace or require helicopter operators to use particular flight corridors to travel between locations. Nevertheless, FAA ATC, the FAA Flight Standards District Office, the CCDOA, and helicopter operators historically have identified preferred flight corridors to reduce overflights of residential areas. These flight corridors are documented in Letters of Agreement between the FAA and the helicopter tour operators.

In addition, the CCDOA participates with representatives from FAA ATC, the FAA Flight Standards District Office, and the helicopter operators in a regularly scheduled Helicopter Users' Forum to develop and review noise mitigation recommendations, including ongoing minor modifications to the existing Grand Canyon helicopter routing procedures, which reduce direct overflights of developed residential areas.

¹ Advisory Committee on Helicopter Noise, *2003 Annual Report*, May 2004. In December 2001, the Clark County Board of Commissioners adopted an ordinance that established an Advisory Committee on Helicopter Noise through which various parties can discuss, review, and, where appropriate, formulate potential solutions. The ordinance provided for the appointment of ten members to the committee: seven members who represent neighborhoods directly affected by helicopter overflights, two members who represent commercial operators of helicopters, and one member who represents the Board of County Commissioners.

Exhibit C-2

Existing Helicopter Flight Corridors

Exhibit C-2 shows a map of the Las Vegas region with the existing Grand Canyon helicopter air tour flight corridors (Tropicana and Charleston) to and from McCarran International Airport and the Rendezvous Point in the Lake Mead National Recreation Area.

Table C-2 (1 of 2)

Evaluation of Helicopter Flight Corridors

Route name	Description of route and reason(s) not implemented at time considered	Reason(s) eliminated
Green Valley Railroad (GVRR)	Reinstatement of the Green Valley Railroad route: This route was considered in the late 1990s, but was not reinstated because of FAA concerns with Air Traffic Control workload when the route was previously in use, and because of conflicts with fixed-wing aircraft traffic at McCarran International Airport (Based on previous route utilization, increases in the use of the route would have a potential impact on the primary arrival corridor for fixed-wing aircraft operating at McCarran International Airport. The Green Valley Railroad route is still used today for ad hoc helicopter flight operations).	ATC workload; conflicts with fixed-wing traffic at McCarran
Sahara and Vegas Valley	Inbound along Sahara Avenue or Vegas Valley Drive: This route was considered in the late 1990s, but was not implemented because of conflicts with arrivals into the north-south runways at McCarran International Airport. Additionally, this route would not avoid direct overflight of developed residential areas, and would transfer noise exposure from one neighborhood to another.	Conflicts with fixed-wing traffic at McCarran; noise impact on community
I-215, I-215 v.2, and I-215 v.3	Inbound and outbound over I-215: This route, with three exit variations east of I-95, was considered in 2000, and tested in 2001, but was not implemented because of concerns with compliance (a bend in the I-215 roadway alignment lured some pilots to short-cut the curved routing procedure, directly over a developed residential area), and a desire for higher altitudes. Higher altitudes were being sought for the I-215 route (4,000 feet above MSL instead of 3,000 feet above MSL) to ensure that the route would not transfer noise exposure from one neighborhood to another. The I-215 route at 4,000 feet above MSL was not implemented because the route could only be used when fixed-wing aircraft were only landing from the south (which historically occurs less than 10 percent of the year) to avoid conflict with arrivals from the east, which is the primary arrival corridor for fixed-wing aircraft. (Based on previous route utilization, increases in the use of the route had a potential impact on the primary arrival corridor for fixed-wing aircraft operating at McCarran International Airport.)	Conflicts with fixed-wing traffic at McCarran; noise impact on community
Flamingo and Russell	Outbound over Flamingo Road or Russell Road: These routes were considered in the late 1990's, but were not implemented because of conflicts with fixed-wing aircraft arrivals into McCarran International Airport. Additionally, this route would transfer noise exposure from one neighborhood to another.	Conflicts with fixed-wing traffic at McCarran; noise impact on community
Sloan and Sloan v.2	Outbound along the Sloan departure corridor: This route heads south along the Union Pacific Railroad tracks west of McCarran International Airport, to a power-line corridor used as a visual reference, south of Henderson Executive Airport, and then east. This route was proposed in 1997 and tested in 2001 by Maverick Helicopters, but was not implemented because operators refused to use the route due to the increased fuel needed to operate on that route.	Increases in flight time and fuel consumption; route not feasible for operators
Nellis and Nellis I-15	Inbound over Nellis Air Force Base and over I-15: This route was considered in 2000 and tested with the Metropolitan Police Department, but was not implemented because of the increased fuel needed to operate on that route and security issues as the result of flight proximity to Nellis Air Force Base.	Security issue

Table C-2 (2 of 2)

Evaluation of Helicopter Flight Corridors

Route name	Description of route and reason(s) not implemented at time considered	Reason(s) eliminated
Nellis Speedway	Inbound north of Nellis Air Force Base to the Las Vegas Motor Speedway: This route was considered in 2001, but was not implemented because of security issues as the result of flight proximity to Nellis Air Force Base.	Security issue
S.I-15	Outbound south along I-15: This route was considered in the late 1990s, but was not implemented because of the impact on fixed-wing aircraft departures to the south and arrivals from the north, and because of the increase in flight-time, similar to that found with the test of the Sloan routes.	Conflicts with fixed-wing traffic at McCarran

Notes:

MSL = Mean Sea Level

ATC = Air Traffic Control

Sources: Clark County Department of Aviation; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., April 2008

A number of different helicopter corridors, listed in Table C-2 and shown on **Exhibit C-3**, have been explored by the CCDOA in coordination with the FAA and/or the helicopter air tour operators through the Helicopter Users' Forum. All of the corridors were located over major thoroughfares or over developed commercial and/or industrial areas. As summarized in Table C-2, the routes could not be implemented due to safety, community impact concerns, or operator refusal to use the route and would therefore not be considered as initial alternatives in this EA.

C.3 Initial Alternative Sites Considered in the Environmental Assessment

Brief descriptions of the alternative sites for development of heliport facilities that considered as initial alternatives in this EA are provided below.

C.3.1 Sites Not Currently Developed for Aviation Uses

As a build alternative, a new facility to accommodate Grand Canyon helicopter air tours would be constructed on a site not currently developed for aviation uses.

- **South of Sloan** – The South of Sloan site is located to the east of Interstate 15 and Las Vegas Boulevard South, about 5.5 miles south of St. Rose Parkway. The site consists of about 229 acres and is undeveloped and clear of structures. The site is within unincorporated Clark County, is publicly owned and managed by the BLM. The land north, south, and east of the site is undeveloped public land.

Although it was not evaluated in the Site Suitability Assessment, the South of Sloan site identified in early 2004 after completion of the Site Suitability Assessment. Based on public input and a separate site evaluation (SOS Site Assessment [I-9]), this site was designated by the County as the preferred site for a Southern Nevada Regional Heliport. (See Appendix B for a timeline of planning studies.)

- **GoKart/Sloan** – The GoKart/Sloan site is located on the east of Interstate 15 and Las Vegas Boulevard South, about three miles south of St. Rose Parkway. The GoKart/Sloan site, which is owned by Clark County, consists of about 49 acres. The site is partially developed and has several structures in its vicinity, including a go-kart facility, power lines, telephone lines, and billboards that run along Interstate 15. The site is surrounded primarily by vacant public and private land.

This site was identified as the preferred site based on the screening criteria and evaluation from the Site Suitability Assessment. Based on refined facilities planning for the Heliport and analysis in this EA, it was determined that the existing private land located on the western portion of the site would not limit the development and operation of the Heliport.

Exhibit C-3

Eliminated Helicopter Flight Corridor Options

Exhibit C-3 shows a map of the Las Vegas region with all of the helicopter flight corridors that were assessed and eliminated from further consideration. The helicopter flight corridors are also described in Table C-2.

- **Eldorado Valley** – The Eldorado Valley site is located about 2.5 miles south-southwest of the intersection of U.S. Highways 95 and 93 in Boulder City, Nevada. The site consists of approximately 54 acres. The site is publicly owned and managed by the BLM. The majority of the land around the site is also undeveloped, publicly owned and managed by the BLM. This greenfield site is undeveloped and clear of structures, except for high voltage power lines and transmission lines that traverse the site.

This site is about one-half mile north of the site identified in the Site Suitability Assessment as the Eldorado Valley/Boulder City site. The revised location for the site was identified after completion of the Site Suitability Assessment based on discussions with City of Boulder City representatives, and was selected so that it would be entirely within unincorporated Clark County, and outside the limits of Boulder City.

- **Sunrise Landfill** – The Sunrise Landfill site is located at the eastern end of Vegas Valley Drive, about 4.9 miles east of the intersection of Boulder Highway and U.S. Highway 95. The Sunrise Landfill site consists of approximately 160 acres. The land is leased by Clark County from the BLM and is clear of structures. Most of the land around the site is undeveloped. The closest residence is about 1.5 miles to the west.

The site was a municipal solid waste landfill originally designed with a refuse capacity of approximately 61 million cubic yards. With an estimated 47 million cubic yards of waste in place, the landfill accepted its last load of waste on October 8, 1993, and was officially closed in March 1995.

C.3.2 Existing Aviation Facilities

As a partial-build alternative, facilities would be constructed to accommodate Grand Canyon helicopter air tours at an existing aviation facility. Grand Canyon helicopter air tour operators would be able to relocate to an improved existing aviation facility in the Las Vegas region.

- **Henderson Executive Airport** – This airport is located within the City of Henderson, and about 6 miles south of McCarran International Airport. The airport occupies 722 acres, of which about 157 acres are non-airfield land [I-8]. Henderson Executive Airport is owned by Clark County and is operated by the Clark County Board of County Commissioners through the CCDOA, with a portion of the land leased from the BLM. The facility is developed as an airport, with adjacent residential land uses.
- **Jean Airport** – Jean Airport is a developed aviation facility located adjacent to Interstate 15 and State Highway 161 in Jean, Nevada. This airport occupies about 317 acres, of which 104 acres are non-airfield land. Jean Airport is owned by Clark County and operated by the Clark County Board of County Commissioners through the CCDOA. The airport's primary role is to accommodate sport aviation, including aerobatic aircraft, gliders, and ultralight aircraft. The Gold Strike Casino, which is located at the northeast end of Jean Airport, also attracts transient general aviation activity to the airport. The area surrounding the airport is partially developed, with commercial and industrial areas north of the airport.
- **North Las Vegas Airport** – North Las Vegas Airport is located in the City of North Las Vegas, Clark County. The airport is about five miles northwest of downtown Las Vegas, and about eight miles northwest of McCarran. North Las Vegas Airport occupies about 797 acres of land. The airport is owned by Clark County and is operated by the Clark County Board of County Commissioners through the CCDOA. North Las Vegas Airport serves as the primary general aviation reliever airport to McCarran; the Airport also accommodates Grand Canyon

tour operators, several based blimps, and provide landing and temporary basing for blimps that visit Las Vegas for major conventions and promotional events.

- **Mesquite Municipal Airport** – Mesquite Municipal Airport is located about two miles north of the City of Mesquite near the Nevada/Utah border, and about 80 miles northeast of Las Vegas. The Airport is owned and operated by the City of Mesquite and occupies 513 acres of land.
- **Boulder City Municipal Airport** – Boulder City Municipal Airport is located about 22 miles southeast of McCarran and one mile southwest of Boulder City. The airport occupies 512 acres of land. The City of Boulder City owns and operates this airport, which accommodates general aviation, helicopter operations, and some Grand Canyon air tour operations.