

APPENDIX B

NOISE

This appendix contains terminology, methodology, and assumptions used in the assessment of aircraft noise for the existing condition, No-Action Alternative and Proposed Action.

- B-1 Aircraft Noise Descriptors
- B-2 Effects of Aircraft Noise on People
- B-3 Noise Analysis
- B-4 References

B-1 AIRCRAFT NOISE DESCRIPTORS

A variety of noise metrics are used to assess airport noise impacts in different ways. Noise metrics are used to describe individual noise events (such as a single operation of an aircraft taking off overhead) or groups of events (such as the cumulative effect of numerous aircraft operations, the collection of which creates a general noise environment or overall exposure level). Both types of descriptors are helpful in explaining how people tend to respond to a given noise condition. Descriptions of these metrics are provided below.

Decibel, dB – Sound is a complex physical phenomenon consisting of complex minute vibrations traveling through a medium, such as air. These vibrations are sensed by the human ear as sound pressure. Because of the vast range of sound pressure or intensity detectable by the human ear, sound pressure level (SPL) is represented on a logarithmic scale known as decibels (dB). A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet (laboratory-type) listening conditions. A SPL of 120 dB begins to be felt inside the ear as discomfort and pain at approximately 140 dB. Most environmental sounds have SPLs ranging from 30 to 100 dB.

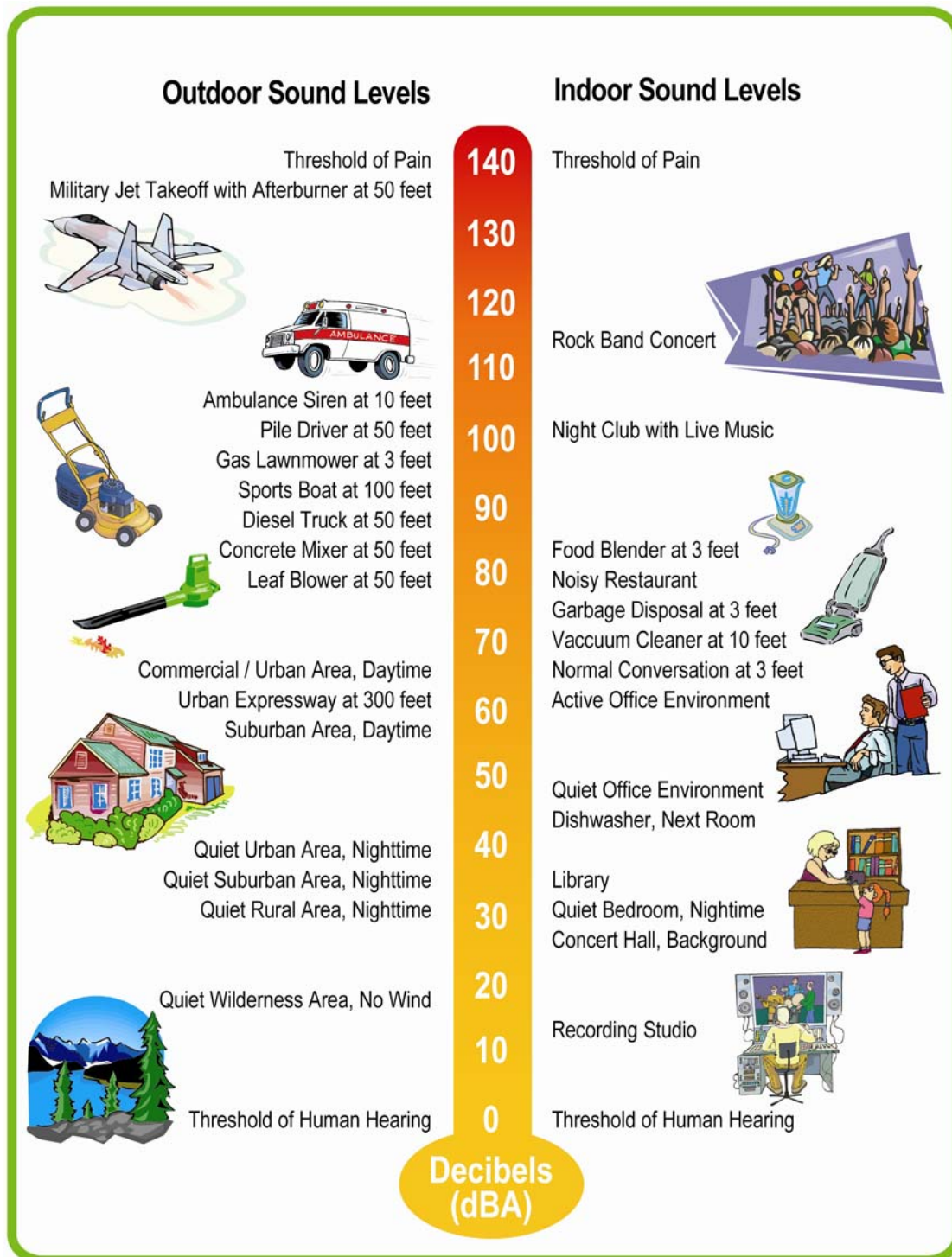
Because decibels are logarithmic, they cannot be added or subtracted directly like other (linear) numbers. For example, if two sound sources each produce 100 dB, when they are operated together they will produce 103 dB, not 200 dB. Four 100 dB sources operating together again double the sound energy, resulting in a total SPL of 106 dB, and so on. In addition, if one source is much louder than another, the two sources operating together will produce the same SPL as if the louder source were operating alone. For example, a 100 dB source plus an 80 dB source produce 100 dB when operating together. The louder source masks the quieter one.

Two useful rules to remember when comparing SPLs are: (1) most people perceive a 6 to 10 dB increase in SPL between two noise events to be about a doubling of loudness, and (2) changes in SPL of less than about 3 dB between two events are not easily detected outside of a laboratory.

A-Weighted Decibel, dBA – Frequency, or pitch, is a basic physical characteristic of sound and is expressed in units of cycles per second or hertz (Hz). The normal frequency range of hearing for most people extends from about 20 to 15,000 Hz. Because the human ear is more sensitive to middle and high frequencies (i.e., 1000 to 4000 Hz), a frequency weighting called "A" weighting is applied to the measurement of sound. The internationally standardized "A" filter approximates the sensitivity of the human ear and helps in assessing the perceived loudness of various sounds. In this document all sound levels are A-weighted sound levels and the adjective "A-weighted" has been omitted.

Figure B-1.1 charts common indoor and outdoor sound levels. A quiet rural area at nighttime may be 30 dBA or lower while the operator of a typical gas lawn mower may experience a level of 90 dBA. Similarly, the level in a library may be 30 dBA or lower while the listener at a rock band concert may experience levels near 110 dBA.

**FIGURE B-1.1
COMMON OUTDOOR AND INDOOR SOUND LEVELS**



Source: URS Corporation, 2008

Maximum A-Weighted Noise Level, L_{max} – Sound levels vary with time. For example, the sound increases as an aircraft approaches, then falls and blends into the ambient or background as the aircraft recedes into the distance. Because of this variation, it is often convenient to describe a particular noise "event" by its highest or maximum sound level (L_{max}). Note L_{max} describes only one dimension of an event; it provides no information on the cumulative noise exposure generated by a sound source. In fact, two events with identical L_{max} may produce very different total exposures. One may be of very short duration, while the other may be much longer.

Sound Exposure Level, SEL – The most common measure of noise exposure for a single aircraft flyover is the SEL. SEL is a summation of the A-weighted sound energy at a particular location over the true duration of a noise event normalized to a fictional duration of one second. The true duration is defined as the amount of time the noise event exceeds background levels. For events lasting more than one second, SEL does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event.

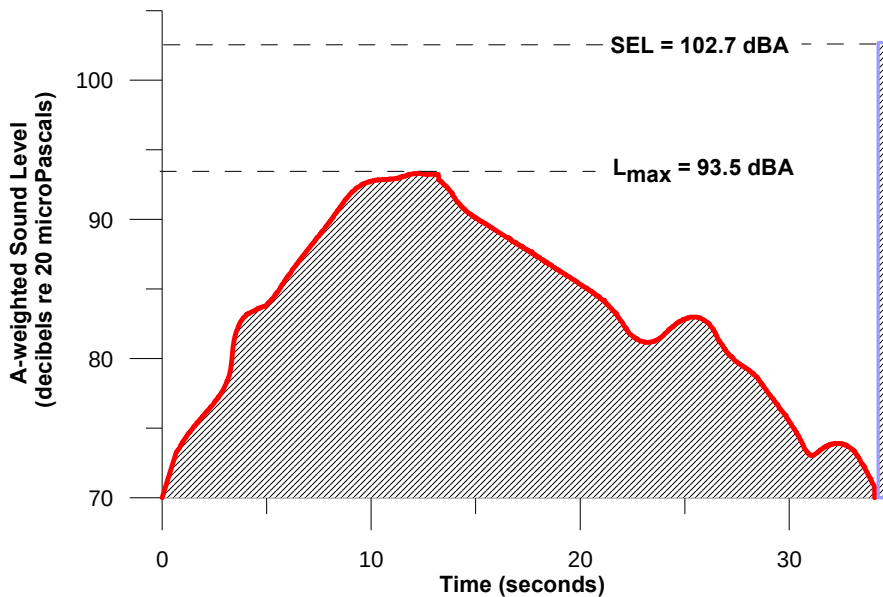
The normalization to the fictional duration of one second enables the comparison of noise events with differing true duration and/or maximum level. Because the SEL is normalized to one second, it will almost always be larger in magnitude than the L_{max} for the event. In fact, for most aircraft events, the SEL is about 7 to 12 dB higher than the L_{max} . Additionally, since it is a cumulative measure, a higher SEL can result from either a louder or longer event, or some combination.

As SEL combines an event's overall sound level along with its duration, SEL provides a comprehensive way to describe noise events for use in modeling and comparing noise environments. Computer noise models, such as the one employed for this document, base their computations on these SELs.

Figure B-1.2 shows an event's "time history," the variation of sound level with time. For typical sound events experienced by a fixed listener, like a person experiencing an aircraft flying by, the sound level rises as the source (or aircraft) approaches the listener, peaks and then diminishes as the aircraft flies away from the listener. The area under the time history curve represents the overall sound energy of the noise event. The L_{max} for the event shown in the figure was 93.5 dBA. Compressing the event's total sound energy into one second to compute its SEL yields 102.7 dBA.

Equivalent Sound Level, L_{eq} -- Equivalent sound level (abbreviated L_{eq}) is a measure of the exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest (e.g., an hour, an 8-hour school day, nighttime, or a full 24-hour day). However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example $L_{eq(8)}$ or $L_{eq(24)}$.

FIGURE B-1.2
COMPARISON OF MAXIMUM SOUND LEVEL (L_{MAX}) AND SOUND EXPOSURE LEVEL (SEL)



Source: URS Corporation, 2007.

Conceptually, L_{eq} may be thought of as a constant sound level over the period of interest that contains as much sound energy as the actual time-varying sound level with its normal “peaks” and “dips.” In the context of noise from typical aircraft flight events and as noted earlier for SEL, L_{eq} does not represent the sound level heard at any particular time, but rather represents the total sound exposure for the period of interest. Also, it should be noted that the “average” sound level suggested by L_{eq} is not an arithmetic value, but a logarithmic, or “energy-averaged,” sound level. Thus, loud events tend to dominate the noise environment described by the L_{eq} metric.

Day-Night Average Sound Level, DNL, and Community Noise Equivalent Level, CNEL - Time-averaged sound levels are measurements of sound levels averaged over a specified length of time. These levels provide a measure of the average sound energy during the measurement period. For the evaluation of community noise effects, and particularly aircraft noise effects, the Day-Night Average Sound Level (DNL) or the Community Noise Equivalent Level (CNEL) is used. Both metrics are similar to the Equivalent Sound Level (L_{eq}) except that they compensate for the widely assumed increase in people’s sensitivity to noise during nighttime hours. Each aircraft operation occurring between 10:00 p.m. and 7:00 a.m. is treated as if it were 10 operations. Similarly, CNEL (but not DNL) includes a penalty weighting for operations taking place between 7:00 and 10:00 p.m. in the evening. Each aircraft operation during these hours is counted as if it were three operations. Logarithmically, these multipliers are the equivalent of adding 10 dB to the noise level of each nighttime operation and 4.77 dB to the noise level of each evening operation. These noise level penalties are intended to correspond to the drop in background noise level which studies have found takes place from daytime to evening and nighttime in a typical community. The evening and nighttime decrease in ambient sound levels—from both outdoor and

indoor sources—is commonly considered to be the principal explanation for people's heightened sensitivity to noises during these periods. (CalTrans, 2002)

CNEL is the primary noise descriptor of this study. CNEL is a 24-hour time-weighted-average noise metric expressed in A-weighted decibels (dBA) which accounts for the noise levels (in terms of SEL) of all individual aircraft events, the number of times those events occur, and the time of day at which they occur. Values of CNEL can be measured with standard monitoring equipment or predicted with computer models. This document utilizes estimates of CNEL with an FAA-approved computer-based noise model.

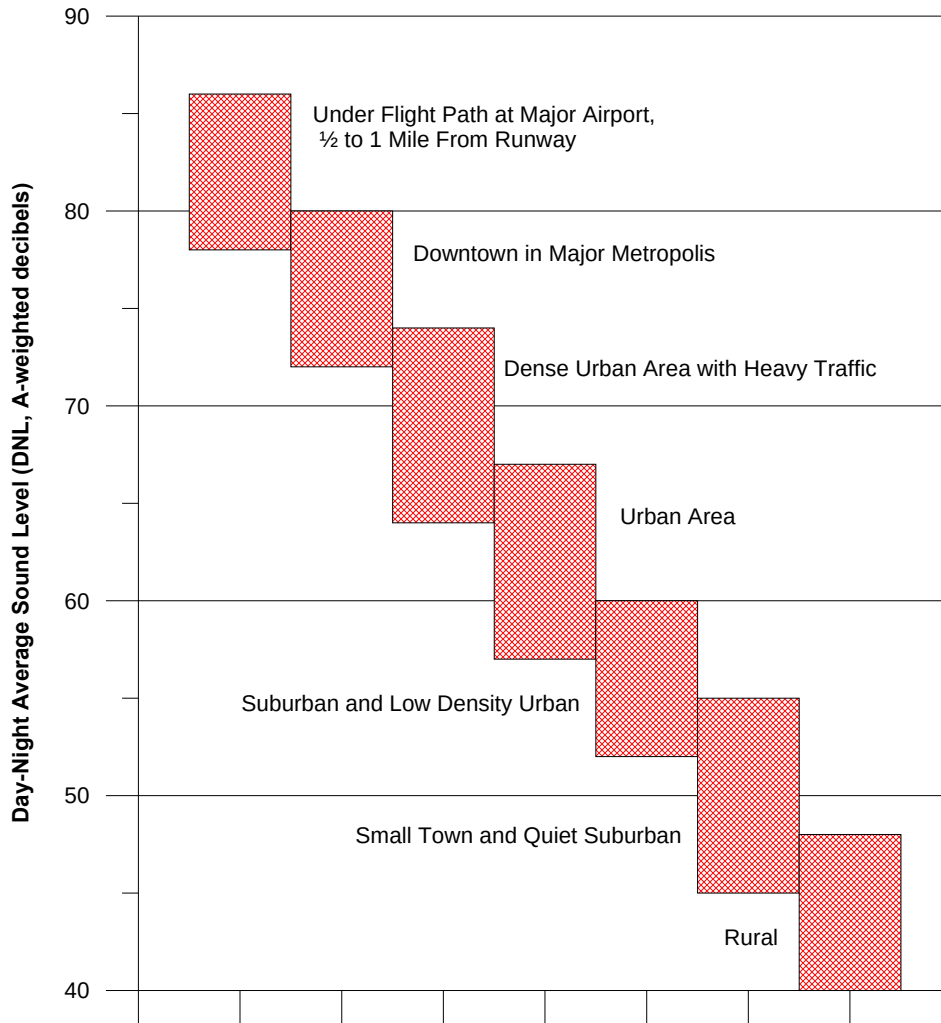
Typical DNL values for a variety of noise environments are shown in [Figure B-1.3](#). DNL values can be approximately 85 dBA outdoors under a flight path within a mile of a major airport and 40 dBA or less outdoors in a rural residential area. CNEL values would be similar.

Due to the CNEL and DNL descriptor's close correlation with the degree of community annoyance from aircraft noise, CNEL and DNL have been formally adopted by most Federal agencies for measuring and evaluating aircraft noise for land use planning and noise impact assessment. CNEL has been adopted by the State of California. Federal committees such as the Federal Interagency Committee on Urban Noise (FICUN) and the Federal Interagency Committee on Noise (FICON) which include the Environmental Protection Agency (EPA), Federal Aviation Administration (FAA), Department of Defense (DOD), Department of Housing and Urban Development (HUD), and Veterans Administration (VA), found DNL to be the best metric for land use planning. They also found no new cumulative sound descriptors or metrics of sufficient scientific standing to substitute for DNL. Other cumulative metrics could be used only to supplement, not replace DNL. Furthermore, FAA Order 1050.1E for environmental impact studies, requires DNL be used in describing cumulative noise exposure and in identifying aircraft noise/land use compatibility issues, although the FAA recognizes CNEL as an alternative metric for California (EPA, 1974; FICUN, 1980; FICON, 1992; 14 CFR part 150, 2007; FAA, 2006).

Time-Above a Specified Level – The Time-Above a Specified Level (TA) metric describes the total number of minutes that instantaneous sound level (usually from aircraft) are above a given threshold. For example, if the natural ambient noise level is the specified threshold, the metric would be referred to as “TA_{natural}.” The TA metric is typically associated with 24-hour annual average daily conditions but can be used to represent any time period. Any threshold may be chosen for the TA calculation.

Number of Events Above a Specified Level – Number-of-events Above (NA) is a noise metric that reflects the average number of times noise equals or exceeds a chosen threshold level during a specified time period. NA contours can be depicted at any noise threshold level (x) and any user defined number of events (z), using the notation “NAX(z),” meaning “z” events at or above noise level “x.” These analysis parameters (x and z) may differ in each affected community, based on specific circumstances. No guidelines have yet been established for NA analyses, but individual jurisdictions may apply Federal guidelines in such a way as to reflect unique conditions at each airport. Therefore, each jurisdiction has some latitude in establishing local noise standards. The NA metric provides for much flexibility and can be tailored to any noise environment, such as daytime, nighttime, or any user-defined number of hours.

FIGURE B-1.3
TYPICAL RANGE OF OUTDOOR COMMUNITY DAY-NIGHT AVERAGE SOUND LEVELS



Source: DOD, 1978

B-2 EFFECTS OF AIRCRAFT NOISE ON PEOPLE

This section addresses three ways humans can be affected by aircraft noise: annoyance, speech interference and sleep disturbance.

Annoyance – The primary potential effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by the Environmental Protection Agency as any negative subjective reaction on the part of an individual or group (EPA, 1974). Scientific studies and a large number of social/attitudinal surveys have been conducted to appraise people's annoyance to all types of environmental noise, especially aircraft events. These studies and surveys have found the DNL to be the

best measure of this annoyance (EPA, 1974; FICUN, 1980; FICON, 1992; ANSI, 2007; ANSI, 2003; Schultz, 1978; Fidell, et. al., 1991).

The relationship between annoyance and DNL determined by the scientific community and endorsed by many Federal agencies, including the FAA, is shown in [Figure B-2.1](#). For a DNL of 65 dBA, approximately 13% of the exposed population would be highly-annoyed. The figure also shows at very low values of DNL, such as 45 dB or less, 1% or less of the exposed population would be highly annoyed. At very high values of DNL, such as 90 dBA, more than 80% of the exposed population would be highly annoyed.

It is often suggested a lower DNL, such as 60 or 55 dB, be adopted as the threshold of community noise annoyance for FAA environmental analysis documents. While there is no technical reason why a lower level cannot be measured or calculated for comparison purposes, a DNL of 65 dB:

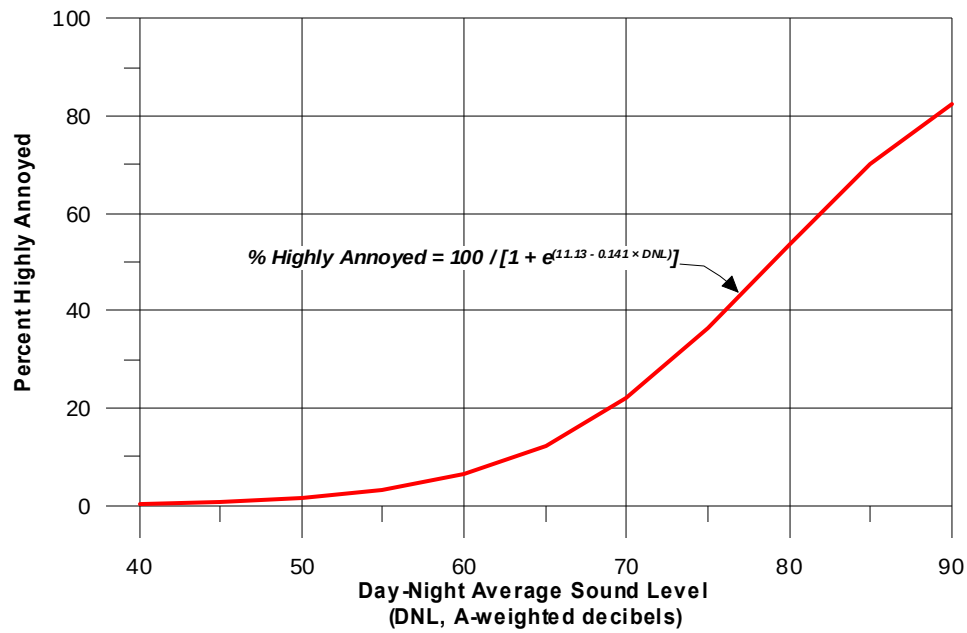
1. Provides a valid basis for comparing and assessing community noise effects.
2. Represents a noise exposure level normally dominated by aircraft noise and not other community or nearby highway noise sources.
3. Reflects the FAA's threshold for grant-in-aid funding of airport noise mitigation projects.
4. HUD also established a DNL standard of 65 dBA for eligibility for Federally-guaranteed home loans.

Speech Interference – A primary effect of aircraft noise is its tendency to drown out or "mask" speech, making it difficult to carry on a normal conversation. As an aircraft approaches and its sound level increases, speech becomes harder to hear. As the ambient level increases, the talker must raise his/her voice, or the individuals must get closer together to continue talking.

For typical communication distances of 3 or 4 feet (1 to 1.5 meters), acceptable outdoor conversations can be carried on in a normal voice as long as the ambient noise outdoors is less than about 65 dBA (FICON, 1992). If the noise exceeds this level, intelligibility would be lost unless vocal effort was increased or communication distance was decreased.

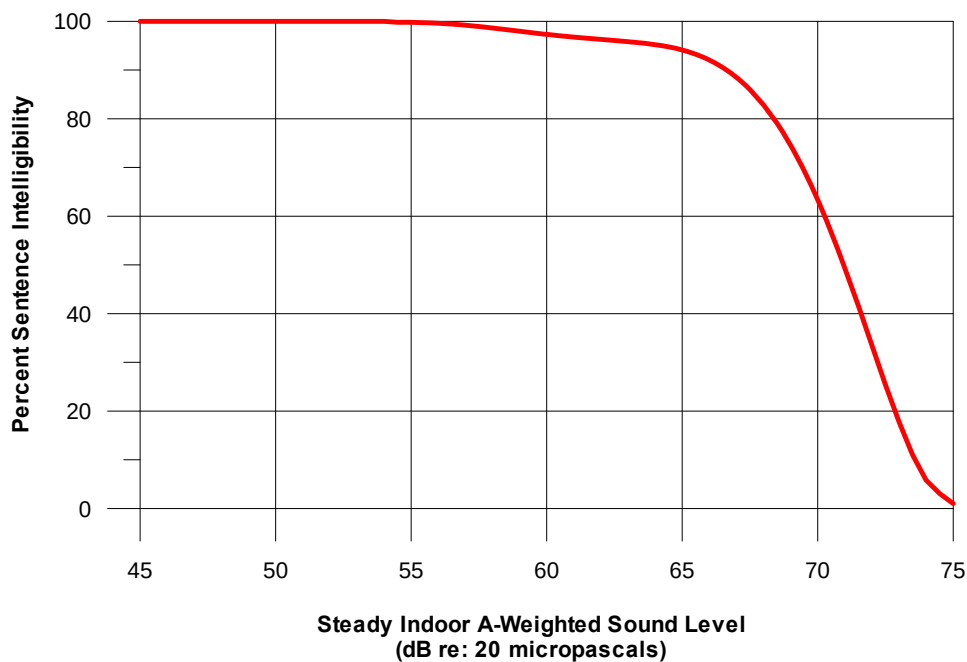
Indoor speech interference can be expressed as a percentage of sentence intelligibility between two average adults with normal hearing speaking fluently in relaxed conversation approximately one meter apart in a typical living room or bedroom (EPA, 1974). As shown in [Figure B-2.2](#), the percentage of sentence intelligibility is a non-linear function of the (steady) indoor ambient or background sound level (24-hour energy-average equivalent sound level ($L_{eq(24)}$)). Steady ambient indoor sound levels of up to 45 dBA $L_{eq(24)}$ are expected to allow 100% intelligibility of sentences. The curve shows 99 percent sentence intelligibility for $L_{eq(24)}$ at or below 54 dBA and less than 10 percent intelligibility for $L_{eq(24)}$ greater than 73 dBA. In the same document from which [Figure B-2.2](#) was taken, the EPA established an indoor criterion of 45 dBA DNL as requisite to protect against speech interference indoors (EPA, 1974).

FIGURE B-2.1
RELATIONSHIP BETWEEN ANNOYANCE AND DAY-NIGHT AVERAGE SOUND LEVEL



Source: FICON, 1992

FIGURE B-2.2
PERCENT SENTENCE INTELLIGIBILITY FOR INDOOR SPEECH



Source: EPA, 1974.

B-3 NOISE ANALYSIS

B-3.1 Existing Condition Noise Modeling Assumptions

Integrated Noise Model (INM)

The INM has been the FAA's standard tool since 1978 for determining the predicted noise impact near airports. The FAA developed the INM computer model and it is the required method to predict airport noise contours. The FAA continually enhances the INM to take advantage of increased computer speed, to incorporate new aircraft types into the aircraft noise database, and to improve its noise computation algorithms. INM Version 7.0b, released September 30, 2009, was the version used for this EA (http://www.faa.gov/about/office_org/headquarters_offices/aep/models/inm_model/). The INM is an average-value-model and is designed to estimate long-term average effects using average annual input conditions. Because of this, differences between predicted and measured values can occur because certain local acoustical variables are not averaged, or because they may not be explicitly modeled in INM. Differences may also occur due to errors or improper procedures employed during the collection of the measured data.

Examples of detailed local acoustical variables include:

- Temperature profiles;
- Wind gradients;
- Humidity effects;
- Ground absorption;
- Individual aircraft directivity patterns; and
- Sound diffraction caused by terrain, buildings, barriers, etc.

Terrain data was also used in the calculation of noise exposure. The data contains 3-second digital elevation. MMH is surrounded by high mountains. Thus, it is important to incorporate this three-dimensional information about the local environment into the noise modeling. The INM uses terrain elevation to adjust observer-to-aircraft distances when computing noise levels.

The results of the INM analysis provide a relative measure of noise levels around airfield facilities. When the calculations are made in a consistent manner, the INM is most accurate for comparing before and after noise effects resulting from forecast changes or alternative noise control actions. It allows noise levels to be predicted for such proposed projects without the actual implementation and noise monitoring of those actions.

Modeled Aircraft Operations

This section describes in detail the sources and derivation of the INM input data for the existing (2009) conditions including airport layout, weather, flight operations, runway use, flight tracks, track use, and flight profiles.

Airport Layout

MMH has a single runway, which is designated as Runway 09/27. It is 7,000 feet long by 100 feet wide. A full parallel taxiway system, 50 feet wide, supports this runway. The field elevation at MMH is approximately 7,128 feet. Apron and hangar facilities are available for both based and transient aircraft. [Figure B-3.1](#) shows the current runway layout at MMH.

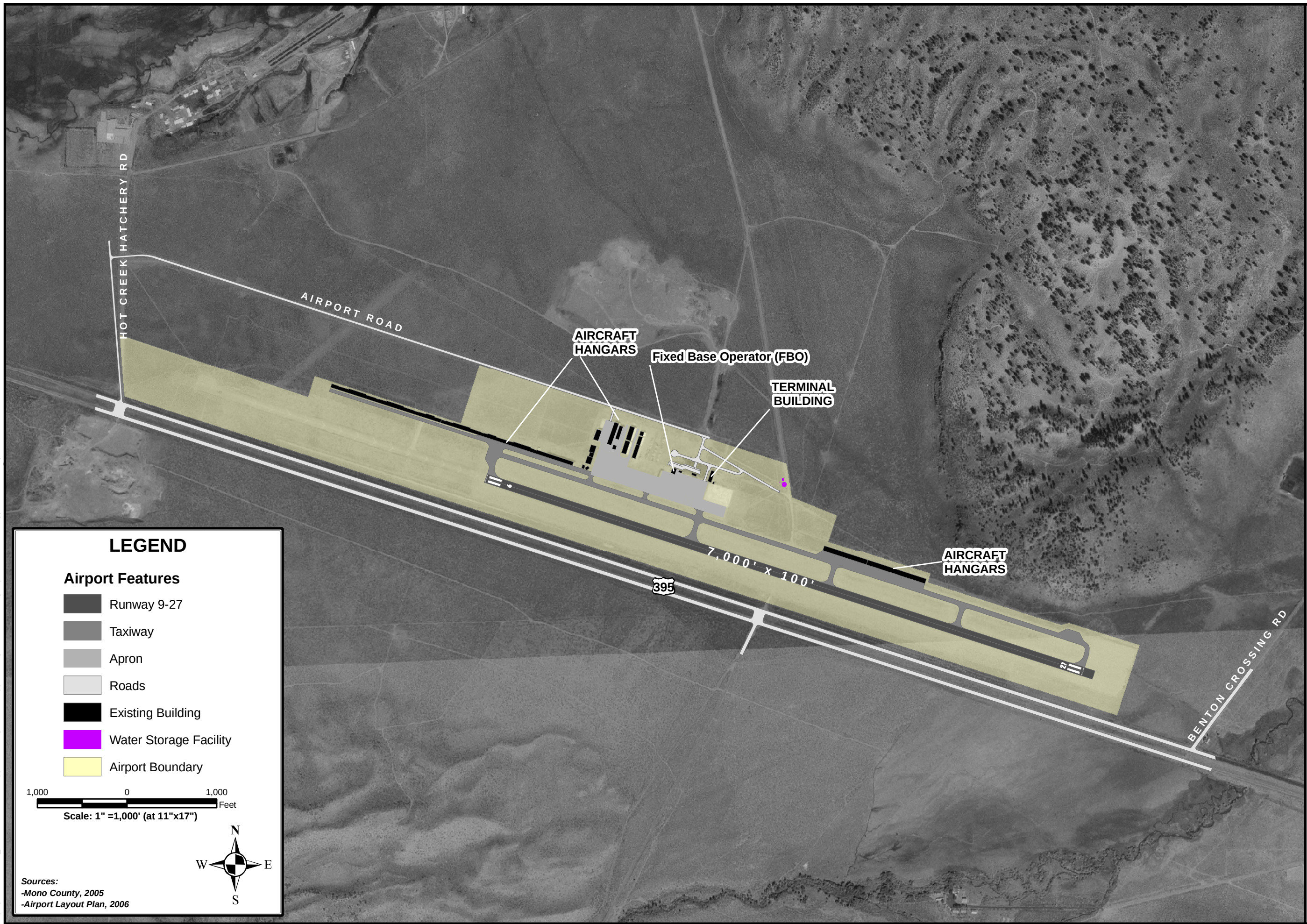
Weather and Climate

The weather conditions used in the INM remain unchanged from those used for the FEIS (FAA, 2008). The average temperature in Lee Vining, the closest monitoring station, is 47.9 degrees (NOAA Climatology of the U.S. No. 81, 2002); humidity for the average annual day in Bishop, CA (National Climatic Data Center, 2004) was determined to be 35.5 percent. The INM default airport pressure is 29.92 inches of mercury because atmospheric pressure is referred to sea level. The default average headwind is 8 knots. The INM default for pressure and headwind was not changed in the model. INM uses temperature, pressure, and headwind when computing procedural profiles. Humidity is only used in calculating atmospheric absorption.

Flight Operations

As shown in [Table B-3.1](#), INM-modeled annual operations for the 2009 Existing Conditions totaled 7,505 operations, an average of approximately 20.6 daily operations. Jet operations accounted for approximately 11.1 percent of the total operations. Evening and nighttime operations accounted for 3.9 percent of the total operations. Helicopters operations accounted for approximately 1.4 percent of the total aircraft operations at MMH.

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Sources:
-Mono County, 2005
-Airport Layout Plan, 2006



TABLE B-3.1
2009 AVERAGE ANNUAL DAILY AIRCRAFT OPERATIONS

INM Aircraft Type	Body Type	Annual Operations	Arrivals				Departures SL 1 (0-500nm)					
			Day	Evening	Night	Total	Day	Evening	Night	Total		
CIT3	J	16	0.0213	0.0000	0.0000	0.0213	0.0213	0.0000	0.0000	0.0213		
CL600		22	0.0307	0.0000	0.0000	0.0307	0.0307	0.0000	0.0000	0.0307		
CNA500		155	0.2055	0.0024	0.0047	0.2126	0.2055	0.0024	0.0047	0.2126		
CNA750		16	0.0213	0.0000	0.0000	0.0213	0.0213	0.0000	0.0000	0.0213		
GII		7	0.0094	0.0000	0.0000	0.0094	0.0094	0.0000	0.0000	0.0094		
GIIB		17	0.0236	0.0000	0.0000	0.0236	0.0236	0.0000	0.0000	0.0236		
GIV		14	0.0189	0.0000	0.0000	0.0189	0.0189	0.0000	0.0000	0.0189		
IA1125		24	0.0307	0.0024	0.0000	0.0331	0.0307	0.0024	0.0000	0.0331		
LEAR25		48	0.0590	0.0047	0.0024	0.0661	0.0590	0.0047	0.0024	0.0661		
LEAR35		159	0.2102	0.0071	0.0000	0.2173	0.2102	0.0071	0.0000	0.2173		
MU3001		355	0.4818	0.0047	0.0000	0.4865	0.4818	0.0047	0.0000	0.4865		
Jet Total		833	1.1123	0.0213	3	0.0071	1.1407	1.1123	0.0213	3	0.0071	1.1407
BEC58P	P	1,068	1.4074	0.0487	0.0070	1.4631	1.4074	0.0487	0.0070	1.4631		
CNA172		315	0.4150	0.0162	0.0000	0.4313	0.4150	0.0162	0.0000	0.4313		
CNA206		1,413	1.8294	0.1043	0.0023	1.9361	1.8294	0.1043	0.0023	1.9361		
GASEPF		308	0.3987	0.0208	0.0023	0.4218	0.3987	0.0208	0.0023	0.4218		
GASEPV		1,991	2.6131	0.1090	0.0046	2.7267	2.6131	0.1090	0.0046	2.7267		
PA28		1	0.0021	0.0000	0.0000	0.0021	0.0019	0.0000	0.0000	0.0019		
PA31		115	0.1484	0.0093	0.0000	0.1577	0.1484	0.0093	0.0000	0.1577		
Prop Total		5,211	6.8141	0.3083	3	0.0162	7.1387	6.8140	0.3083	3	0.0162	7.1385
DHC6	T	735	0.9738	0.0278	0.0046	1.0063	0.9738	0.0278	0.0046	1.0063		
C130		5	0.0070	0.0000	0.0000	0.0070	0.0070	0.0000	0.0000	0.0070		
CNA441		391	0.5171	0.0162	0.0023	0.5356	0.5171	0.0162	0.0023	0.5356		
Q400		220	0.3014	0.0000	0.0000	0.3014	0.3014	0.0000	0.0000	0.3014		
FAL20		3	0.0046	0.0000	0.0000	0.0046	0.0046	0.0000	0.0000	0.0046		
Turboprop Total		1,354	1.8038	0.0441	1	0.0070	1.8548	1.8038	0.0441	1	0.0070	1.8548
B206L	H	5	0.0065	0.0000	0.0000	0.0065	0.0065	0.0000	0.0000	0.0065		
B212		9	0.0130	0.0000	0.0000	0.0130	0.0130	0.0000	0.0000	0.0130		
B222		2	0.0031	0.0000	0.0000	0.0031	0.0031	0.0000	0.0000	0.0031		
EC130		2	0.0031	0.0000	0.0000	0.0031	0.0031	0.0000	0.0000	0.0031		
H500D		9	0.0130	0.0000	0.0000	0.0130	0.0130	0.0000	0.0000	0.0130		
R22		17	0.0227	0.0000	0.0000	0.0227	0.0227	0.0000	0.0000	0.0227		
S65		7	0.0097	0.0000	0.0000	0.0097	0.0097	0.0000	0.0000	0.0097		
S76		5	0.0065	0.0000	0.0000	0.0065	0.0065	0.0000	0.0000	0.0065		
SA350D		50	0.0682	0.0000	0.0000	0.0682	0.0682	0.0000	0.0000	0.0682		
Helicopter Total		106	0.1459	0.0000	0	0.0000	0.1459	0.0000	0	0.0000	0.1459	
Grand Total		7,505	9.8761	0.3733	6	0.0303	10.2800	9.8760	0.3733	6	0.0303	10.2799

J - Jet, P - Prop, T - Turboprop, H - Helicopter

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

SL = Stage Length

Note: Numbers may not add, due to rounding.

Source: URS Corp., 2010.

Runway Use

A summary of the modeled annual average daily utilization of MMH's runway is presented in [Table B-3.2](#). The percentages shown in the table are the same as in the FEIS (FAA, 2008). The airport confirmed those percentages are still valid for the 2009 Existing Condition. Approximately 68 percent of the arrivals use Runway 27 and most of the departures (67 percent of jet aircraft and turboprop) use Runway 09 due to high terrain west of the airport. Because of terrain northwest of the airport that can affect the takeoff weight allowable for an aircraft, larger aircraft (jet and turboprop aircraft) tend to prefer departing on Runway 09. The Q400 is considered an Air Carrier aircraft.

TABLE B-3.2
2009 EXISTING CONDITION RUNWAY UTILIZATION

ARRIVALS				
Runway	Air Carrier	Business Jets	Commuter / Turboprops	Props / Helos
09	25.00%	31.60%	31.60%	31.70%
27	75.00%	68.40%	68.40%	68.30%
TOTAL	100.00 %	100.00 %	100.00%	100.00%
DEPARTURES				
Runway	Air Carrier	Business Jets	Commuter / Turboprops	Props / Helos
09	75.00%	67.10%	67.10%	31.70%
27	25.00%	32.90%	32.90%	68.30%
TOTAL	100.00 %	100.00 %	100.00%	100.00%

Source: FAA, 2008.

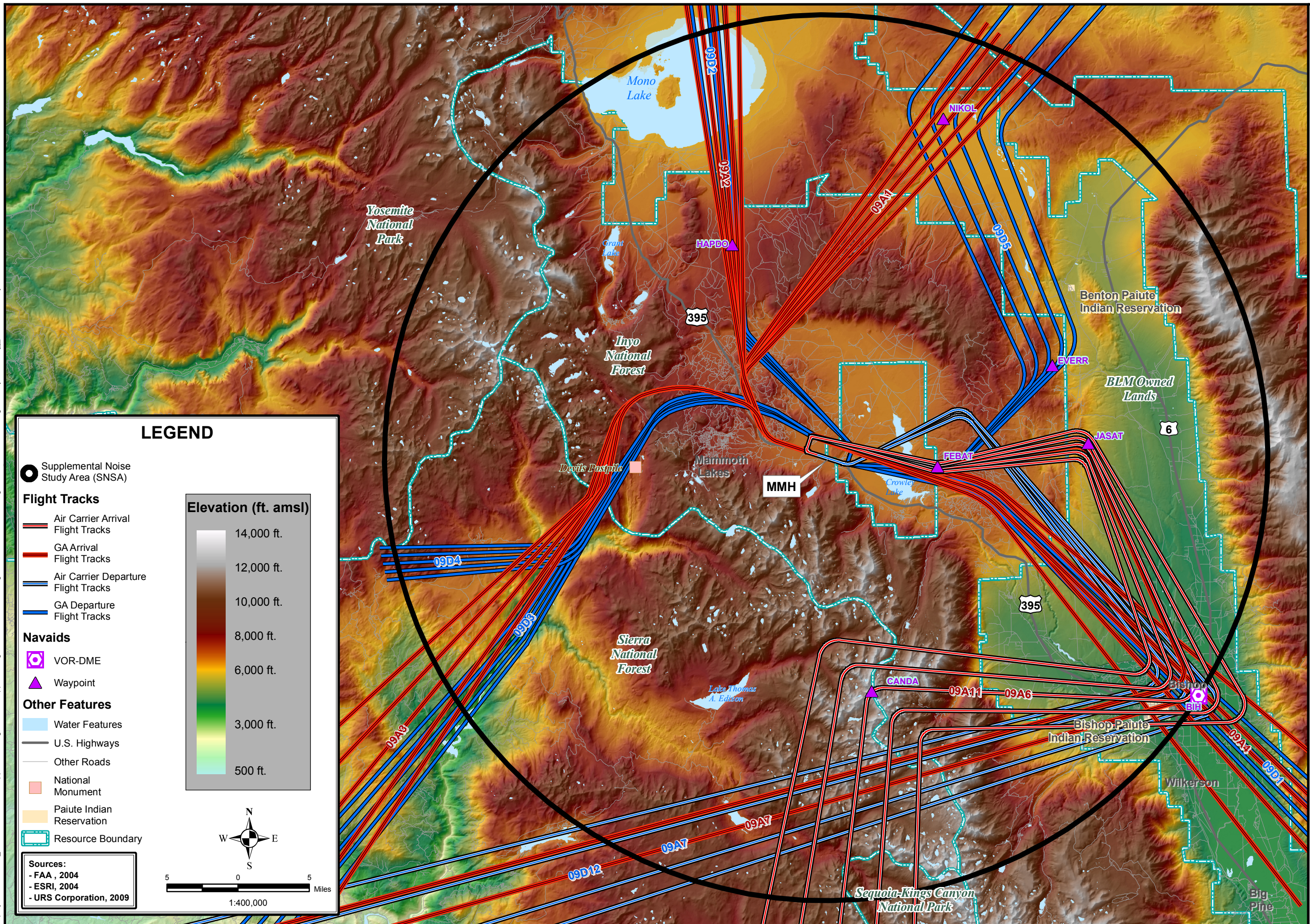
Flight Tracks

Flight tracks are the aircraft's actual path through the air projected vertically onto the ground. Modeled flight tracks reflect a reasonable representation of the actual flight track recognizing that pilot technique and weather conditions will affect the actual track of individual flights. [Figures B-3.2 and B-3.3](#) depict modeled east and west flow tracks. East flow tracks represent aircraft using Runway 09. West flow tracks represent aircraft using Runway 27. During the development of flight tracks, topographic maps were reviewed to identify location of mountains, published U.S. Terminal Procedures were reviewed, and airport personnel were interviewed to accurately establish the location of flight tracks. These flight tracks were also used in the FEIS (FAA, 2008), with the addition of 2 new departure and 2 new arrival tracks (09/27A15 and 09/20D15), based on actual flights.

Track Use

Utilization percentages of the flight tracks are tabulated in [Table B-3.3](#) for arrivals and departures. Because of the terrain surrounding the airport, it was assumed that helicopters would use the same flight tracks as fixed wing aircraft.

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Environmental Assessment
Mammoth Yosemite Airport
United Airlines Operations Specifications
Amendment Service to/from MMH

2009 EXISTING CONDITIONS
EAST FLOW FLIGHT TRACKS -
AIRCRAFT USING RUNWAY 09

FIGURE
B-3.2

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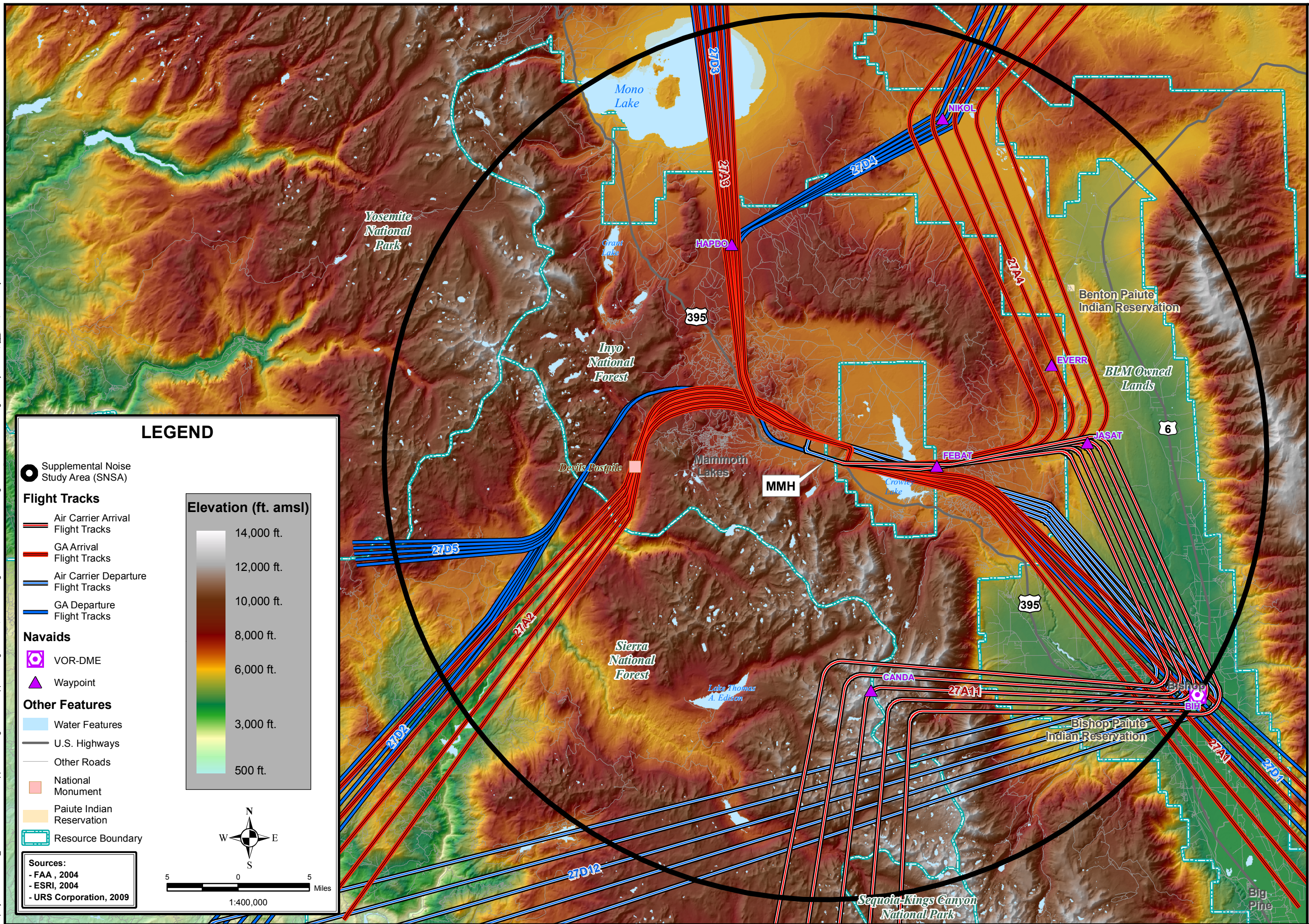


TABLE B-3.3
2009 EXISTING CONDITION FLIGHT TRACK UTILIZATION

GA ARRIVAL				
Runway	Track	Business Jets	TurboProp	Prop/Helo
09	09A1	5.00%	5.00%	5.00%
	09A2	5.00%	5.00%	5.00%
	09A3	0.00%	0.00%	20.00%
	09A4	0.00%	0.00%	70.00%
	09A6	70.00%	70.00%	0.00%
	09A7	20.00%	20.00%	0.00%
	TOTAL	100.00 %	100.00%	100.00%
27	27A1	0.00%	0.00%	70.00%
	27A2	0.00%	0.00%	20.00%
	27A3	5.00%	5.00%	5.00%
	27A4	5.00%	5.00%	5.00%
	27A6	70.00%	70.00%	0.00%
	27A7	20.00%	20.00%	0.00%
	TOTAL	100.00 %	100.00%	100.00%
GA DEPARTURE				
Runway	Track	Business Jets	TurboProp	Prop/Helo
09	09D1	0.00%	0.00%	70.00%
	09D2	5.00%	5.00%	5.00%
	09D3	10.00%	10.00%	10.00%
	09D4	10.00%	10.00%	10.00%
	09D5	5.00%	5.00%	5.00%
	09D7	70.00%	70.00%	0.00%
	TOTAL	100.00 %	100.00%	100.00%
27	27D1	0.00%	0.00%	70.00%
	27D2	10.00%	10.00%	10.00%
	27D3	5.00%	5.00%	5.00%
	27D4	5.00%	5.00%	5.00%
	27D5	10.00%	10.00%	10.00%
	27D7	70.00%	70.00%	0.00%
	TOTAL	100.00 %	100.00%	100.00%
AIR CARRIER ARRIVAL & DEPARTURE				
Runway	Arrival Track	Air Carrier	Departure Track	Air Carrier
09	09A11	100.00%	09D12	100.00%
27	27A11	100.00%	27D12	100.00%

Sources: Conversations with Federal Aviation Administration Personnel, 2004, 2009.
Conversations with Mammoth Yosemite Airport Personnel, 2004, 2009.
URS Corporation, 2010.

Flight Profiles

Flight profiles model the vertical paths of aircraft during departure and arrival to determine the altitude, speed, and engine thrust or power of an aircraft at any point along a flight track. INM uses this information to calculate noise exposure on the ground. Profiles are unique to each aircraft type and vary with temperature, barometric pressure, headwind, and aircraft weight. Stage (or trip) length information determined the standard profile to be used for each departing aircraft. See [Table B-3.4](#) for the definition of stage length.

**TABLE B-3.4
INM STAGE LENGTHS**

Stage	Distance (NM)
1	Less Than 500
2	501 - 1,000
3	1,001 - 1,500
4	1,501 - 2,500
5	2,501 - 3,500
6	3,501 - 4,500
7	4,501-5,500
8	5,501-6,500
9	Greater Than 6,501

Source: FAA, 2007

FAA Part 150 Compatible Land Use Criteria

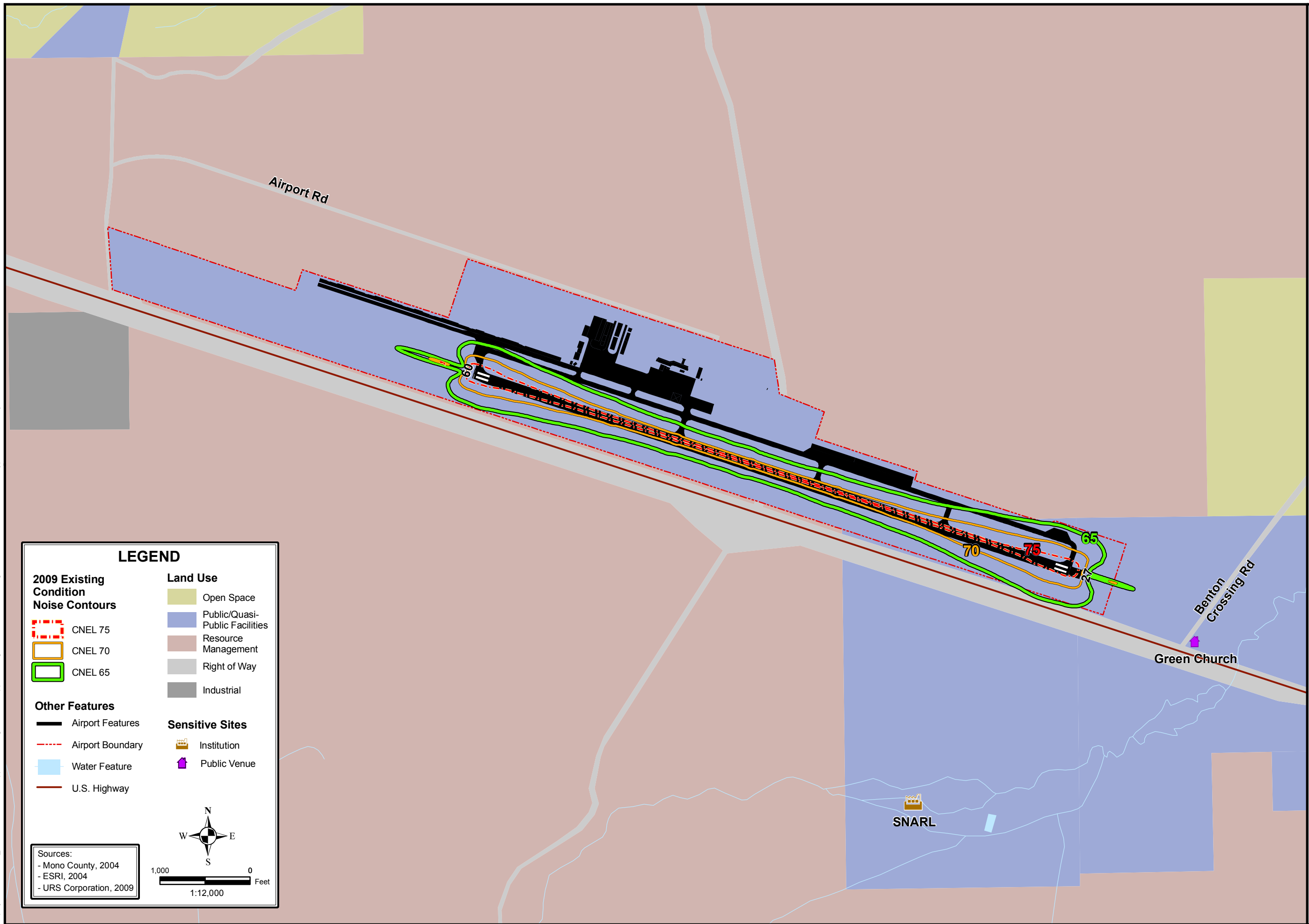
Title 14 CFR part 150, Appendix A, Table 1 (Title 14 CFR part 150, 2007), provides Federal compatible land use guidelines for several land uses as a function of DNL values. Compatible or non-compatible land use is determined by comparing the predicted or measured DNL or CNEL values at a site to the values listed in Table 1. This table is provided as [Table B-3.5](#).

B-3.2 Existing Condition Results

For aviation noise analyses, the FAA has determined that the cumulative noise energy exposure of individuals, resulting from aviation activities, must be established in terms of yearly DNL as FAA's primary metric. The FAA recognizes CNEL as an alternative metric for California (FAA, 2006). Therefore, for California environmental documents, FAA defines CNEL 65 dB as the threshold of noise compatibility with residential land uses (California Governor's Office of Planning and Research, 2003). [Figure B-3.4](#) depicts the 2009 Existing Condition noise contours. The contours were superimposed over the local land use map, and acreage was calculated.

There is no residential land use or noise sensitive sites within the CNEL 65 dB contour. [Table B-3.6](#) identifies land use and acreage within the CNEL 65 dB contours for 2009 Existing Conditions.

H:\projects\Mammoth_Lakes\EA\12009122\Applications\Figures\Draft\Appendix\Figure B-3.4, 2009 Existing Condition Noise Contours.mxd, [pdf, hde, 03/16/10]



2009 EXISTING CONDITION
NOISE CONTOURS

FIGURE
B-3.4

TABLE B-3.5
LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

	Yearly Day-Night Average Sound Level (DNL)					
	Below 65 Decibels	65-70 Decibels	70-75 Decibels	75-80 Decibels	80-85 Decibels	Over 85 Decibels
<u>Residential</u>						
Residential (Other than mobile homes & transient lodges)	Y	N ¹	N ¹	N	N	N
Mobile Home Parks	Y	N	N	N	N	N
Transient Lodging	Y	N ¹	N ¹	N ¹	N	N
<u>Public Use</u>						
Schools	Y	N ¹	N ¹	N	N	N
Hospitals, Nursing Homes	Y	25	30	N	N	N
Churches, Auditoriums, Concert Halls	Y	25	30	N	N	N
Governmental Services	Y	Y	25	30	N	N
Transportation	Y	Y	Y ²	Y ³	Y ⁴	Y ⁴
Parking	Y	Y	Y ²	Y ³	Y ⁴	N
<u>Commercial Use</u>						
Offices, Business & Professional	Y	Y	25	30	N	N
Wholesale & Retail Building Materials, Hardware & Farm Equipment	Y	Y	Y ²	Y ³	Y ⁴	N
Retail Trade - General	Y	Y	25	30	N	N
Utilities	Y	Y	Y ²	Y ³	Y ⁴	N
Communications	Y	Y	25	30	N	N
<u>Manufacturing & Production</u>						
Manufacturing, General	Y	Y	Y ²	Y ³	Y ⁴	N
Photographic and Optical	Y	Y	25	30	N	N
Agriculture (Except Livestock) & Forestry	Y	Y ⁶	Y ⁷	Y ⁸	Y ⁸	Y ⁸
Livestock Farming & Breeding	Y	Y ⁶	Y ⁷	N	N	N
Mining & Fishing, Resource Production & Extraction	Y	Y	Y	Y	Y	Y
<u>Recreational</u>						
Outdoor Sports Arenas, Spectator Sports	Y	Y ⁵	Y ⁵	N	N	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N	N	N
Nature Exhibits & Zoos	Y	Y	N	N	N	N
Amusement, Parks, Resorts, Camps	Y	Y	Y	N	N	N
Golf Courses, Riding Stables, Water Recreation	Y	Y	25	30	N	N

TABLE B-3.5 (CONTINUED)
LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

NOTE: The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties remains with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land use for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

KEY TO TABLE:

SLUCM	Standard Land Use Coding Manual.
Y (Yes)	Land Use and related structures are compatible without restrictions.
N (No)	Land Use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) are to be achieved through incorporation of noise attenuation into the design and construction of structure.
25,30, or 35	Land use and related structures are generally compatible; measures to achieve NLR of 25, 30, or 35 dB r

¹ Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems

² Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

³ Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

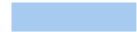
⁴ Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

⁵ Land use compatible provided special sound reinforcement systems are installed.

⁶ Residential buildings require an NLR of 25 dB.

⁷ Residential buildings require an NLR of 30 dB.

⁸ Residential buildings not permitted.

 Noncompatible land use.

Source: Title 14 CFR part 150, 2007.

TABLE B-3.6
2009 NOISE IMPACTS TO LAND USE (ACRES)

Off-Airport Land Use	Noise Contour Interval			
	CNEL 65 dBA	CNEL 70 dBA	CNEL 75+ dBA	Total
Public/Quasi-Public Facilities	0.4	0.0	0.0	0.4
Right of Way	0.0	0.0	0.0	0.0
Off-Airport Land Use Total	0.4	0.0	0.0	0.4
On-Airport Land Use	CNEL 65 dBA	CNEL 70 dBA	CNEL 75+ dBA	Total
Public/Quasi-Public Facilities	50.5	23.6	9.5	83.6
On-Airport Land Use Total	50.5	23.6	9.5	83.6
GRAND TOTAL	50.9	23.6	84.0	

Source: URS Corp., 2010

Note: Numbers may not add, due to rounding.

B-3.3 Future Conditions Noise Modeling Assumptions

Flight Operations

As shown in [Table B-3.7](#), INM-modeled annual operations for the 2011 No-Action Alternative totaled 8,714 operations, an average of approximately 23.9 daily operations. The fleet mix and day/evening/night split did not change from the existing condition. [Table B-3.8](#) shows the 2011 Proposed Action modeled operations. There are 8,714 operations with an additional 330 CRJ aircraft operations. In total, it is an average of approximately 24.5 daily operations.

As shown in [Table B-3.9](#), INM-modeled annual operations for the 2015 No-Action Alternative totaled 9,850 operations. As with the 2011 forecast, the fleet mix and day/evening/night split did not change from the existing condition. [Table B-3.10](#) shows the 2015 Proposed Action modeled operations. There are 9,850 operations however 330 of the Q400 aircraft operations are replaced with the CRJ. In total, it is an average of approximately 27.0 daily operations in both scenarios.

Runway Use

Runway utilization remains unchanged from the 2009 Existing Condition. A summary of the 2011 and 2015 modeled average annual daily utilization of MMH's runway is presented in [Table B-3.11](#). This table includes the GA runway utilization, but also shows the air carrier utilization for the Q400 and CRJ.

TABLE B-3.7
2011 NO-ACTION ALTERNATIVE AVERAGE ANNUAL DAILY AIRCRAFT OPERATIONS

INM Aircraft Type	Body Type	Annual Operations	Arrivals				Departures SL 1 (0-500nm)			
			Day	Evening	Night	Total	Day	Evening	Night	Total
CIT3	J	16	0.0216	0.0000	0.0000	0.0216	0.0216	0.0000	0.0000	0.0216
CL600		23	0.0311	0.0000	0.0000	0.0311	0.0311	0.0000	0.0000	0.0311
CNA500		157	0.2084	0.0024	0.0048	0.2156	0.2084	0.0024	0.0048	0.2156
CNA750		16	0.0216	0.0000	0.0000	0.0216	0.0216	0.0000	0.0000	0.0216
GII		7	0.0096	0.0000	0.0000	0.0096	0.0096	0.0000	0.0000	0.0096
GIIB		17	0.0240	0.0000	0.0000	0.0240	0.0240	0.0000	0.0000	0.0240
GIV		14	0.0192	0.0000	0.0000	0.0192	0.0192	0.0000	0.0000	0.0192
IA1125		24	0.0311	0.0024	0.0000	0.0335	0.0311	0.0024	0.0000	0.0335
LEAR25		49	0.0599	0.0048	0.0024	0.0671	0.0599	0.0048	0.0024	0.0671
LEAR35		161	0.2132	0.0072	0.0000	0.2204	0.2132	0.0072	0.0000	0.2204
MU3001		360	0.4887	0.0048	0.0000	0.4935	0.4887	0.0048	0.0000	0.4935
Jet Total		845	1.1284	0.0216	0.0072	1.1572	1.1284	0.0216	0.0072	1.1572
BEC58P	P	1,083	1.4278	0.0494	0.0071	1.4842	1.4278	0.0494	0.0071	1.4842
CNA172		319	0.4210	0.0165	0.0000	0.4375	0.4210	0.0165	0.0000	0.4375
CNA206		1,434	1.8559	0.1058	0.0024	1.9641	1.8559	0.1058	0.0024	1.9641
GASEPF		312	0.4044	0.0211	0.0024	0.4279	0.4044	0.0211	0.0024	0.4279
GASEPV		2,019	2.6509	0.1106	0.0047	2.7662	2.6509	0.1106	0.0047	2.7662
PA28		1	0.0021	0.0000	0.0000	0.0021	0.0020	0.0000	0.0000	0.0020
PA31		117	0.1505	0.0094	0.0000	0.1599	0.1505	0.0094	0.0000	0.1599
Prop Total		5,287	6.9127	0.3128	0.0165	7.2419	6.9125	0.3128	0.0165	7.2418
DHC6	T	745	0.9879	0.0282	0.0047	1.0208	0.9879	0.0282	0.0047	1.0208
C130		5	0.0071	0.0000	0.0000	0.0071	0.0071	0.0000	0.0000	0.0071
CNA441		397	0.5245	0.0165	0.0024	0.5434	0.5245	0.0165	0.0024	0.5434
Q400		1,324	1.8137	0.0000	0.0000	1.8137	1.8137	0.0000	0.0000	1.8137
FAL20		3	0.0046	0.0000	0.0000	0.0046	0.0046	0.0000	0.0000	0.0046
Turboprop Total		2,474	3.3378	0.0447	0.0071	3.3896	3.3378	0.0447	0.0071	3.3896
B206L	H	5	0.0065	0.0000	0.0000	0.0065	0.0066	0.0000	0.0000	0.0066
B212		10	0.0132	0.0000	0.0000	0.0132	0.0132	0.0000	0.0000	0.0132
B222		2	0.0032	0.0000	0.0000	0.0032	0.0032	0.0000	0.0000	0.0032
EC130		2	0.0032	0.0000	0.0000	0.0032	0.0032	0.0000	0.0000	0.0032
H500D		10	0.0132	0.0000	0.0000	0.0132	0.0132	0.0000	0.0000	0.0132
R22		17	0.0231	0.0000	0.0000	0.0231	0.0231	0.0000	0.0000	0.0231
S65		7	0.0099	0.0000	0.0000	0.0099	0.0099	0.0000	0.0000	0.0099
S76		5	0.0066	0.0000	0.0000	0.0066	0.0066	0.0000	0.0000	0.0066
SA350D		50	0.0692	0.0000	0.0000	0.0692	0.0692	0.0000	0.0000	0.0692
Helicopter Total		108	0.1479	0.0000	0.0000	0.1479	0.1480	0.0000	0.0000	0.1480
Grand Total		8,714	11.5268	0.3799	0.0307	11.9366	11.5268	0.3799	0.0307	11.9365

J - Jet, P - Prop, T - Turboprop, H - Helicopter

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

SL = Stage Length

Note: Numbers may not add, due to rounding.

Source: URS Corp., 2010.

TABLE B-3.8
2011 PROPOSED ACTION ALTERNATIVE AVERAGE ANNUAL DAILY AIRCRAFT OPERATIONS

INM Aircraft Type	Body Type	Annual Operations	Arrivals				Departures SL 1 (0-500nm)					
			Day	Evening	Night	Total	Day	Evening	Night	Total		
CIT3	J	16	0.0216	0.0000	0.0000	0.0216	0.0216	0.0000	0.0000	0.0216		
CL600		23	0.0311	0.0000	0.0000	0.0311	0.0311	0.0000	0.0000	0.0311		
CNA500		157	0.2084	0.0024	0.0048	0.2156	0.2084	0.0024	0.0048	0.2156		
CNA750		16	0.0216	0.0000	0.0000	0.0216	0.0216	0.0000	0.0000	0.0216		
CRJ-900ER		230	0.3151	0.0000	0.0000	0.3151	0.3151	0.0000	0.0000	0.3151		
GII		7	0.0096	0.0000	0.0000	0.0096	0.0096	0.0000	0.0000	0.0096		
GIIB		17	0.0240	0.0000	0.0000	0.0240	0.0240	0.0000	0.0000	0.0240		
GIV		14	0.0192	0.0000	0.0000	0.0192	0.0192	0.0000	0.0000	0.0192		
IA1125		24	0.0311	0.0024	0.0000	0.0335	0.0311	0.0024	0.0000	0.0335		
LEAR25		49	0.0599	0.0048	0.0024	0.0671	0.0599	0.0048	0.0024	0.0671		
LEAR35		161	0.2132	0.0072	0.0000	0.2204	0.2132	0.0072	0.0000	0.2204		
MU3001		360	0.4887	0.0048	0.0000	0.4935	0.4887	0.0048	0.0000	0.4935		
Jet Total		1075	1.4435	0.0216	6	0.0072	1.4723	1.4435	0.0216	6	0.0072	1.4723
BEC58P	P	1,083	1.4278	0.0494	0.0071	1.4842	1.4278	0.0494	0.0071	1.4842		
CNA172		319	0.4210	0.0165	0.0000	0.4375	0.4210	0.0165	0.0000	0.4375		
CNA206		1,434	1.8559	0.1058	0.0024	1.9641	1.8559	0.1058	0.0024	1.9641		
GASEPF		312	0.4044	0.0211	0.0024	0.4279	0.4044	0.0211	0.0024	0.4279		
GASEPV		2,019	2.6509	0.1106	0.0047	2.7662	2.6509	0.1106	0.0047	2.7662		
PA28		1	0.0021	0.0000	0.0000	0.0021	0.0020	0.0000	0.0000	0.0020		
PA30		0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
PA31		117	0.1505	0.0094	0.0000	0.1599	0.1505	0.0094	0.0000	0.1599		
Prop Total		5,287	6.9127	0.3128	8	0.0165	7.2419	6.9125	0.3128	8	0.0165	7.2418
DHC6	T	745	0.9879	0.0282	0.0047	1.0208	0.9879	0.0282	0.0047	1.0208		
C130		5	0.0071	0.0000	0.0000	0.0071	0.0071	0.0000	0.0000	0.0071		
CNA441		397	0.5245	0.0165	0.0024	0.5434	0.5245	0.0165	0.0024	0.5434		
Q400		1,324	1.8137	0.0000	0.0000	1.8137	1.8137	0.0000	0.0000	1.8137		
FAL20		3	0.0046	0.0000	0.0000	0.0046	0.0046	0.0000	0.0000	0.0046		
Turboprop Total		2,474	3.3378	0.0447	7	0.0071	3.3896	3.3378	0.0447	7	0.0071	3.3896
B206L	H	5	0.0066	0.0000	0.0000	0.0066	0.0066	0.0000	0.0000	0.0066		
B212		10	0.0132	0.0000	0.0000	0.0132	0.0132	0.0000	0.0000	0.0132		
B222		2	0.0032	0.0000	0.0000	0.0032	0.0032	0.0000	0.0000	0.0032		
EC130		2	0.0032	0.0000	0.0000	0.0032	0.0032	0.0000	0.0000	0.0032		
H500D		10	0.0132	0.0000	0.0000	0.0132	0.0132	0.0000	0.0000	0.0132		
R22		17	0.0231	0.0000	0.0000	0.0231	0.0231	0.0000	0.0000	0.0231		
S65		7	0.0099	0.0000	0.0000	0.0099	0.0099	0.0000	0.0000	0.0099		
S76		5	0.0066	0.0000	0.0000	0.0066	0.0066	0.0000	0.0000	0.0066		
SA350D		50	0.0692	0.0000	0.0000	0.0692	0.0692	0.0000	0.0000	0.0692		
Helicopter Total		108	0.1480	0.0000	0	0.0000	0.1480	0.1480	0.0000	0	0.0000	0.1480
Grand Total		8,944	11.8420	0.3790	0	0.0307	12.2517	11.8419	0.3790	0	0.0307	12.2516

J - Jet, P - Prop, T - Turboprop, H - Helicopter

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

SL = Stage Length

Notes: The CRJ-900ER is INM substitution for the CRJ-700. Numbers may not add, due to rounding.

Source: URS Corp., 2010.

TABLE B-3.9
2015 NO-ACTION ALTERNATIVE AVERAGE ANNUAL DAILY AIRCRAFT OPERATIONS

INM Aircraft Type	Body Type	Annual Operations	Arrivals				Departures SL 1 (0-500nm)					
			Day	Evening	Night	Total	Day	Evening	Night	Total		
CIT3	J	16	0.0222	0.0000	0.0000	0.0222	0.0222	0.0000	0.0000	0.0222		
CL600		23	0.0321	0.0000	0.0000	0.0321	0.0321	0.0000	0.0000	0.0321		
CNA500		162	0.2145	0.0025	0.0049	0.2219	0.2145	0.0025	0.0049	0.2219		
CNA750		16	0.0222	0.0000	0.0000	0.0222	0.0222	0.0000	0.0000	0.0222		
GII		7	0.0099	0.0000	0.0000	0.0099	0.0099	0.0000	0.0000	0.0099		
GIIB		18	0.0247	0.0000	0.0000	0.0247	0.0247	0.0000	0.0000	0.0247		
GIV		14	0.0197	0.0000	0.0000	0.0197	0.0197	0.0000	0.0000	0.0197		
IA1125		25	0.0321	0.0025	0.0000	0.0345	0.0321	0.0025	0.0000	0.0345		
LEAR25		50	0.0616	0.0049	0.0025	0.0690	0.0616	0.0049	0.0025	0.0690		
LEAR35		166	0.2194	0.0074	0.0000	0.2268	0.2194	0.0074	0.0000	0.2268		
MU3001		371	0.5030	0.0049	0.0000	0.5079	0.5030	0.0049	0.0000	0.5079		
Jet Total		869	1.1613	0.0222	2	0.0074	1.1909	1.1613	0.0222	2	0.0074	1.1909
BEC58P	P	1,115	1.4694	0.0508	0.0073	1.5275	1.4694	0.0508	0.0073	1.5275		
CNA172		329	0.4333	0.0169	0.0000	0.4503	0.4333	0.0169	0.0000	0.4503		
CNA206		1,476	1.9099	0.1089	0.0024	2.0213	1.9099	0.1089	0.0024	2.0213		
GASEPF		321	0.4162	0.0217	0.0024	0.4403	0.4162	0.0217	0.0024	0.4403		
GASEPV		2,078	2.7281	0.1138	0.0048	2.8468	2.7281	0.1138	0.0048	2.8468		
PA28		2	0.0022	0.0000	0.0000	0.0022	0.0020	0.0000	0.0000	0.0020		
PA31		120	0.1549	0.0097	0.0000	0.1646	0.1549	0.0097	0.0000	0.1646		
Prop Total		5,441	7.1141	0.321	9	0.0169	7.4529	7.1139	0.321	9	0.0169	7.4528
DHC6	T	767	1.0167	0.0290	0.0048	1.0506	1.0167	0.0290	0.0048	1.0506		
C130		5	0.0073	0.0000	0.0000	0.0073	0.0073	0.0000	0.0000	0.0073		
CNA441		408	0.5398	0.0169	0.0024	0.5592	0.5398	0.0169	0.0024	0.5592		
Q400		2,244	3.0740	0.0000	0.0000	3.0740	3.0740	0.0000	0.0000	3.0740		
FAL20		3	0.0048	0.0000	0.0000	0.0048	0.0048	0.0000	0.0000	0.0048		
Turboprop Total		3,428	4.6425	0.046	0	0.0073	4.6958	4.6425	0.046	0	0.0073	4.6958
B206L	H	5	0.0067	0.0000	0.0000	0.0067	0.0068	0.0000	0.0000	0.0068		
B212		10	0.0136	0.0000	0.0000	0.0136	0.0136	0.0000	0.0000	0.0136		
B222		2	0.0033	0.0000	0.0000	0.0033	0.0033	0.0000	0.0000	0.0033		
EC130		2	0.0033	0.0000	0.0000	0.0033	0.0033	0.0000	0.0000	0.0033		
H500D		10	0.0136	0.0000	0.0000	0.0136	0.0136	0.0000	0.0000	0.0136		
R22		17	0.0237	0.0000	0.0000	0.0237	0.0237	0.0000	0.0000	0.0237		
S65		7	0.0102	0.0000	0.0000	0.0102	0.0102	0.0000	0.0000	0.0102		
S76		5	0.0068	0.0000	0.0000	0.0068	0.0068	0.0000	0.0000	0.0068		
SA350D		52	0.0712	0.0000	0.0000	0.0712	0.0712	0.0000	0.0000	0.0712		
Helicopter Total		111	0.1522	0.000	0	0.0000	0.1522	0.1523	0.000	0	0.0000	0.1523
Grand Total		9,850	13.0701	0.390	1	0.0316	13.4918	13.0701	0.390	1	0.0316	13.4917

J - Jet, P - Prop, T - Turboprop, H - Helicopter

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

SL = Stage Length

Note: Numbers may not add, due to rounding.

Source: URS Corp., 2010.

TABLE B-3.10
2015 PROPOSED ACTION ALTERNATIVE AVERAGE ANNUAL DAILY AIRCRAFT OPERATIONS

INM Aircraft Type	Body Type	Annual Operations	Arrivals				Departures SL 1 (0-500nm)					
			Day	Evening	Night	Total	Day	Evening	Night	Total		
CIT3	J	16	0.0222	0.0000	0.0000	0.0222	0.0222	0.0000	0.0000	0.0222		
CL600		23	0.0321	0.0000	0.0000	0.0321	0.0321	0.0000	0.0000	0.0321		
CNA500		162	0.2145	0.0025	0.0049	0.2219	0.2145	0.0025	0.0049	0.2219		
CNA750		16	0.0222	0.0000	0.0000	0.0222	0.0222	0.0000	0.0000	0.0222		
CRJ-900ER		230	0.3151	0.0000	0.0000	0.3151	0.3151	0.0000	0.0000	0.3151		
GII		7	0.0099	0.0000	0.0000	0.0099	0.0099	0.0000	0.0000	0.0099		
GIIB		18	0.0247	0.0000	0.0000	0.0247	0.0247	0.0000	0.0000	0.0247		
GIV		14	0.0197	0.0000	0.0000	0.0197	0.0197	0.0000	0.0000	0.0197		
IA1125		25	0.0321	0.0025	0.0000	0.0345	0.0321	0.0025	0.0000	0.0345		
LEAR25		50	0.0616	0.0049	0.0025	0.0690	0.0616	0.0049	0.0025	0.0690		
LEAR35		166	0.2194	0.0074	0.0000	0.2268	0.2194	0.0074	0.0000	0.2268		
MU3001		371	0.5030	0.0049	0.0000	0.5079	0.5030	0.0049	0.0000	0.5079		
Jet Total		1,099	1.4764	0.0222	2	0.0074	1.5060	1.4764	0.0222	2	0.0074	1.5060
BEC58P	P	1,115	1.4694	0.0508	0.0073	1.5275	1.4694	0.0508	0.0073	1.5275		
CNA172		329	0.4333	0.0169	0.0000	0.4503	0.4333	0.0169	0.0000	0.4503		
CNA206		1,476	1.9099	0.1089	0.0024	2.0213	1.9099	0.1089	0.0024	2.0213		
GASEPF		321	0.4162	0.0217	0.0024	0.4403	0.4162	0.0217	0.0024	0.4403		
GASEPV		2,078	2.7281	0.1138	0.0048	2.8468	2.7281	0.1138	0.0048	2.8468		
PA28		2	0.0022	0.0000	0.0000	0.0022	0.0020	0.0000	0.0000	0.0020		
PA30		0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
PA31		120	0.1549	0.0097	0.0000	0.1646	0.1549	0.0097	0.0000	0.1646		
Prop Total		5,441	7.1141	0.321	9	0.0169	7.4529	7.1139	0.321	9	0.0169	7.4528
DHC6	T	767	1.0167	0.0290	0.0048	1.0506	1.0167	0.0290	0.0048	1.0506		
C130		5	0.0073	0.0000	0.0000	0.0073	0.0073	0.0000	0.0000	0.0073		
CNA441		408	0.5398	0.0169	0.0024	0.5592	0.5398	0.0169	0.0024	0.5592		
Q400		2,014	2.7589	0.0000	0.0000	2.7589	2.7589	0.0000	0.0000	2.7589		
FAL20		3	0.0048	0.0000	0.0000	0.0048	0.0048	0.0000	0.0000	0.0048		
Turboprop Total		3,198	4.3275	0.046	0	0.0073	4.3807	4.3275	0.046	0	0.0073	4.3807
B206L	H	5	0.0068	0.0000	0.0000	0.0068	0.0068	0.0000	0.0000	0.0068		
B212		10	0.0136	0.0000	0.0000	0.0136	0.0136	0.0000	0.0000	0.0136		
B222		2	0.0033	0.0000	0.0000	0.0033	0.0033	0.0000	0.0000	0.0033		
EC130		2	0.0033	0.0000	0.0000	0.0033	0.0033	0.0000	0.0000	0.0033		
H500D		10	0.0136	0.0000	0.0000	0.0136	0.0136	0.0000	0.0000	0.0136		
R22		17	0.0237	0.0000	0.0000	0.0237	0.0237	0.0000	0.0000	0.0237		
S65		7	0.0102	0.0000	0.0000	0.0102	0.0102	0.0000	0.0000	0.0102		
S76		5	0.0068	0.0000	0.0000	0.0068	0.0068	0.0000	0.0000	0.0068		
SA350D		52	0.0712	0.0000	0.0000	0.0712	0.0712	0.0000	0.0000	0.0712		
Helicopter Total		111	0.1523	0.000	0	0.0000	0.1523	0.1523	0.000	0	0.0000	0.1523
Grand Total		9,850	13.0702	0.390	1	0.0316	13.4919	13.0701	0.390	1	0.0316	13.4917

J - Jet, P - Prop, T - Turboprop, H - Helicopter

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

SL = Stage Length

Notes: The CRJ-900ER is INM substitution for the CRJ-700. Numbers may not add, due to rounding.

Source: URS Corp., 2010.

**TABLE B-3.11
FUTURE CONDITION RUNWAY UTILIZATION**

ARRIVALS				
Runway	Air Carrier	Business Jets	Commuter / Turboprops	Props / Helos
09	25.00%	31.60%	31.60%	31.70%
27	75.00%	68.40%	68.40%	68.30%
TOTAL	100.00 %	100.00%	100.00%	100.00%
DEPARTURES				
Runway	Air Carrier	Business Jets	Commuter / Turboprops	Props / Helos
09	75.00%	67.10%	67.10%	31.70%
27	25.00%	32.90%	32.90%	68.30%
TOTAL	100.00 %	100.00%	100.00%	100.00%

Source: FAA, 2008.

Flight Tracks

Figures B-3.5 and B-3.6 depict modeled flight tracks for the 2011 No-Action and Proposed Action Alternatives. **Figure B-3.5** depicts east flow operations, while **Figure B-3.6** depicts west flow operations.

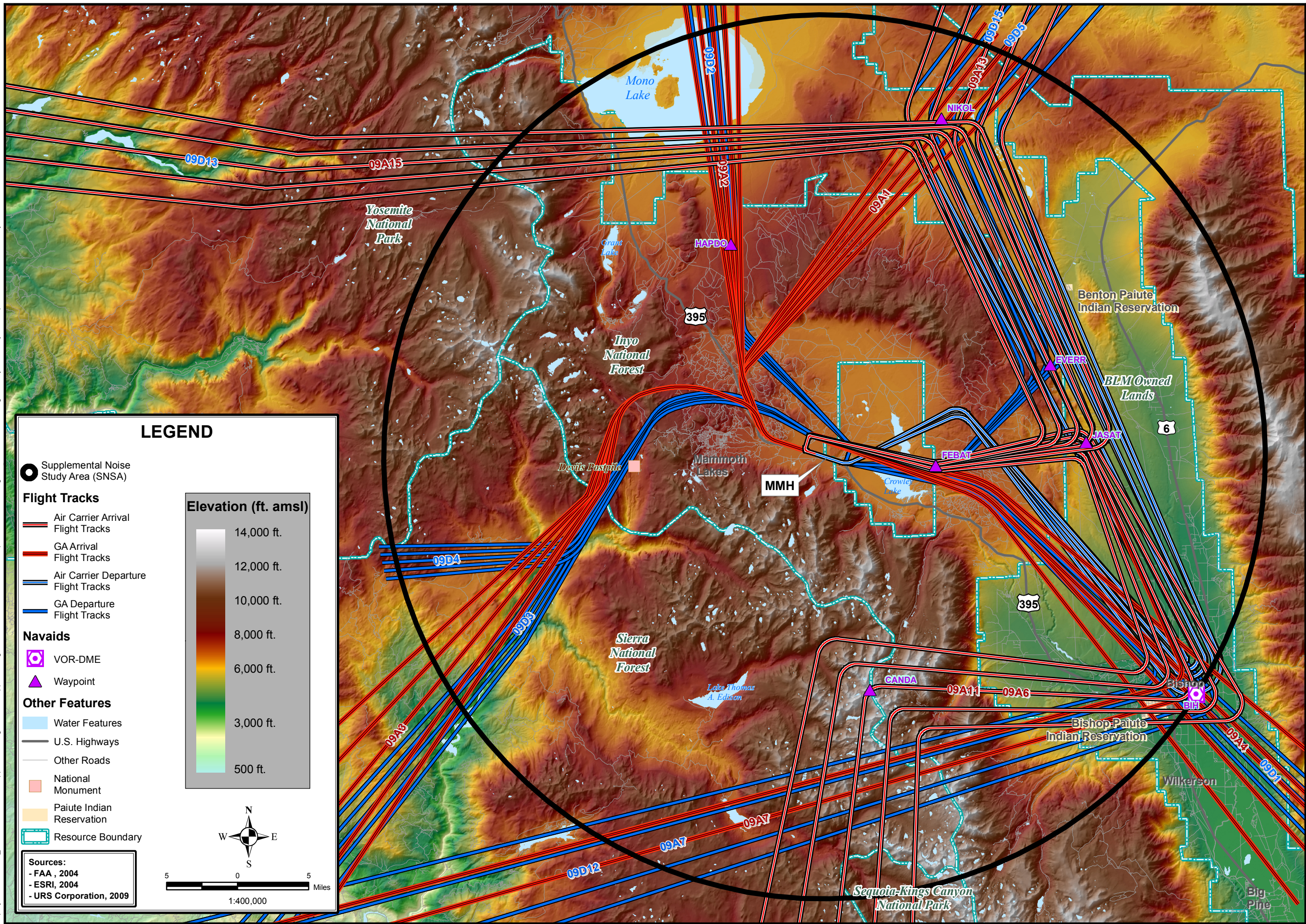
Figures B-3.7 and B-3.8 depict modeled flight tracks for the 2015 No-Action and Proposed Action Alternative. **Figure B-3.7** depicts east flow operations, while **Figure B-3.8** depicts west flow operations.

Year 2015 introduces Tracks 09A10, 27A10, 09D10, 27A10, which are used by the Q400 aircraft. Operation of the CRJ does not result in any additional flight tracks.

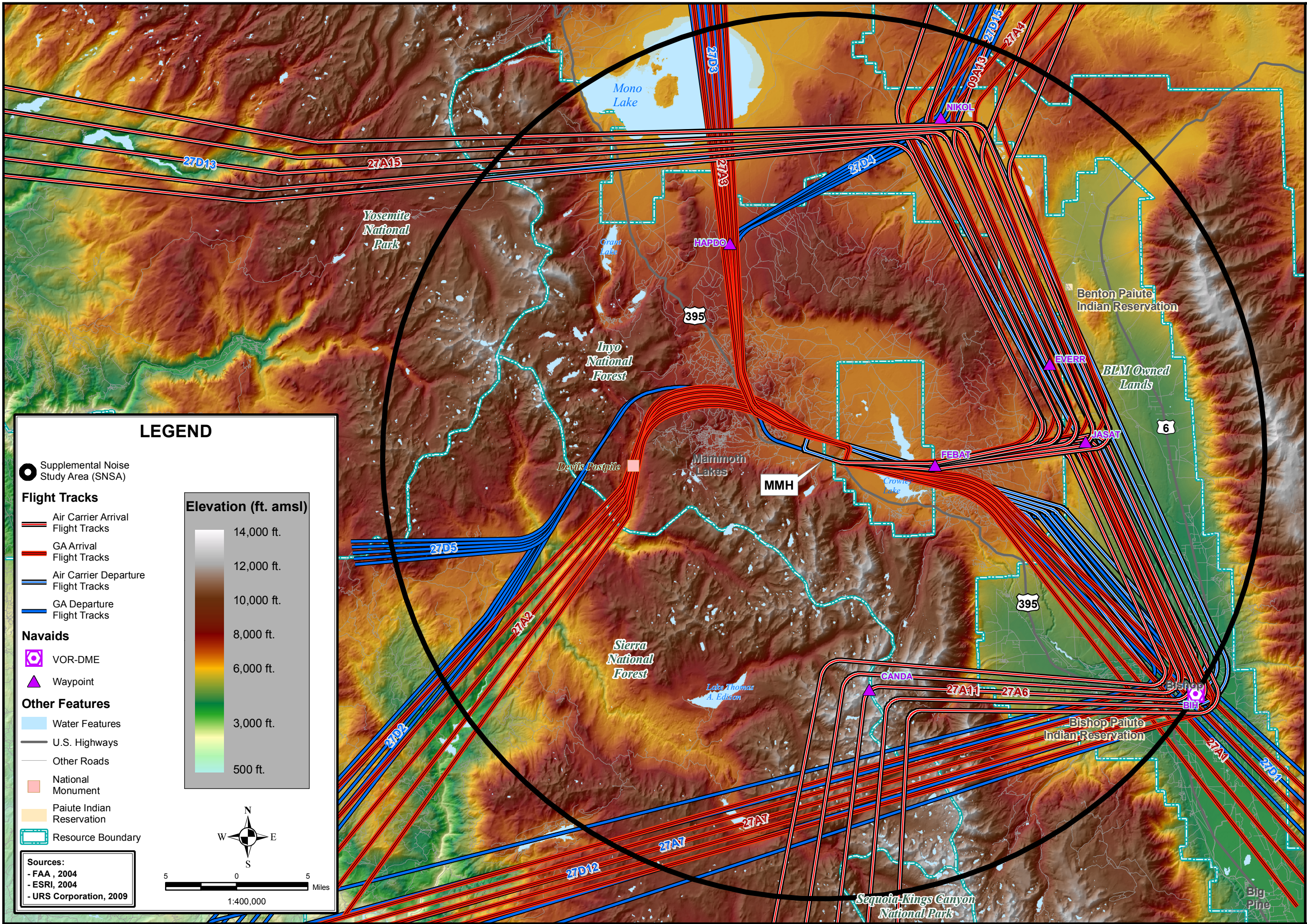
Track Use

GA flight track utilization remains unchanged from the 2009 Existing Condition in the 2011 and 2015 No-Action and Proposed Action Alternatives. Air Carrier flight track utilizations are tabulated in **Table B-3.12** for 2011 No-Action and Proposed Action Alternatives arrivals and departures. Air Carrier flight track utilizations are tabulated in **Table B-3.13** for 2015 No-Action and Proposed Action Alternatives arrivals and departures.

H:\projects\Mammoth_Lakes\EA\12009122\Applications\Figures\Draft\Appendix\Figure B-3.5, 2011 No-Action & Proposed East Flow Flight Tracks - Aircraft Using Runway 09.mxd, {<UND>pf<UND>.hde, 03/16/10}



H:\projects\Mammoth_Lakes\EA\12009122\Applications\Figures\Draft\Appendix\Figure B-3.6, 2011 No-Action & Proposed West Flow Flight Tracks - Aircrafts Using Runway 27.mxd, [<UND>rp<UND>, hde, 03/16/10]



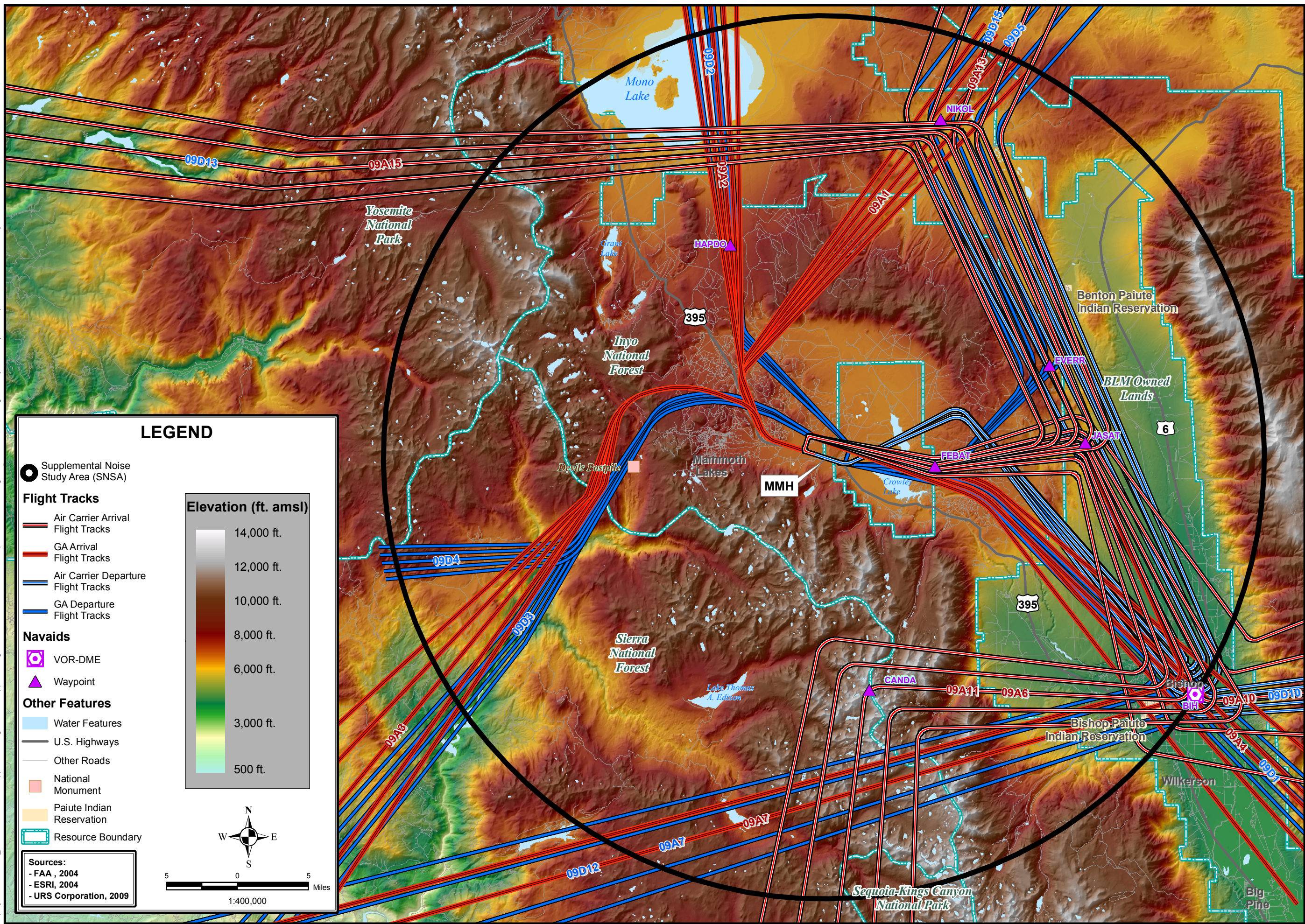
Environmental Assessment
Mammoth Yosemite Airport
United Airlines Operations Specifications
Amendment Service to/from MMH



2011 NO-ACTION & PROPOSED
WEST FLOW FLIGHT TRACKS -
AIRCRAFTS USING RUNWAY 27

FIGURE
B-3.6

H:\projects\Mammoth_Lakes\EA\12009122\Applications\Figures\Draft\Appendix\Figure B-3.7, 2015 No-Action & Proposed East Flow Flight Tracks - Aircraft Using Runway 09.mxd, {<UND>pf<UND>.hde, 03/16/10}



Environmental Assessment
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2015 NO-ACTION & PROPOSED
EAST FLOW FLIGHT TRACKS -
AIRCRAFT USING RUNWAY 09

FIGURE
B-3.7

2015 NO-ACTION & PROPOSED WEST FLOW FLIGHT TRACKS - AIRCRAFT USING RUNWAY 27

FIGURE
B-3.8

**TABLE B-3.12
2011 FUTURE CONDITION AIR CARRIER FLIGHT TRACK UTILIZATION**

NO-ACTION ALTERNATIVE ARRIVALS AND DEPARTURES						
Runway	Track	Q400	CRJ	Track	Q400	CRJ
09	09A11	65.2%	0%	09D12	65.2%	0%
	09A13	17.4%	0%	09D13	17.4%	0%
	09A15	17.4%	0%	09D15	17.4%	0%
	TOTAL	100.00 %	0%	TOTAL	100.00%	0%
27	27A11	65.2%	0%	27D12	65.2%	0%
	27A13	17.4%	0%	27D13	17.4%	0%
	27A15	17.4%	0%	27D15	17.4%	0%
	TOTAL	100.00 %	0%	TOTAL	100.00%	0%
PROPOSED ACTION ALTERNATIVE ARRIVALS AND DEPARTURES						
Runway	Track	Q400	CRJ	Track	Q400	CRJ
09	09A11	65.2%	0%	09D12	65.2%	0%
	09A13	17.4%	0%	09D13	17.4%	100%
	09A15	17.4%	100%	09D15	17.4%	0%
	TOTAL	100.00 %	100.00%	TOTAL	100.00%	100.00%
27	27A11	65.2%	0%	27D12	65.2%	0%
	27A13	17.4%	0%	27D13	17.4%	100%
	27A15	17.4%	100%	27D15	17.4%	0%
	TOTAL	100.00 %	100.00%	TOTAL	100.00%	100.00%

Sources: FAA, 2008;
Conversations with Federal Aviation Administration Personnel,
Conversations with Mammoth Yosemite Airport Personnel,
URS Corporation, 2010.

**TABLE B-3.13
2015 FUTURE CONDITION AIR CARRIER FLIGHT TRACK UTILIZATION**

NO-ACTION ALTERNATIVE ARRIVALS AND DEPARTURES						
Runway	Track	Q400	CRJ	Track	Q400	CRJ
09	09A10	10.2%	0%	09D10	10.2%	0%
	09A11	48.8%	0%	09D12	48.8%	0%
	09A13	10.2%	0%	09D13	30.8%	100%
	09A15	30.8%	100%	09D15	10.2%	0%
	TOTAL	100.00 %	100.00%	TOTAL	100.00%	100.00%
27	27A10	10.2%	0%	27D10	10.2%	0%
	27A11	48.8%	0%	27D12	48.8%	0%
	27A13	10.2%	0%	27D13	30.8%	100%
	27A15	30.8%	100%	27D15	10.2%	0%
	TOTAL	100.00 %	100.00%	TOTAL	100.00%	100.00%
PROPOSED ACTION ALTERNATIVE ARRIVALS AND DEPARTURES						
Runway	Track	Q400	CRJ	Track	Q400	CRJ
09	09A10	11.4%	0%	09D10	11.4%	0%
	09A11	54.4%	0%	09D12	54.4%	0%
	09A13	11.4%	0%	09D13	22.8%	100%
	09A15	22.8%	100%	09D15	11.4%	0%
	TOTAL	100.00 %	100.00%	TOTAL	100.00%	100.00%
27	27A10	11.4%	0%	27D10	11.4%	0%
	27A11	54.4%	0%	27D12	54.4%	0%
	27A13	11.4%	0%	27D13	22.8%	100%
	27A15	22.8%	100%	27D15	11.4%	0%
	TOTAL	100.00 %	100.00%	TOTAL	100.00%	100.00%

Sources: FAA, 2008;
Conversations with Federal Aviation Administration Personnel,
Conversations with Mammoth Yosemite Airport Personnel,
URS Corporation, 2010.

B-3.4 Future Conditions Results

Potential 2011 Impacts

No-Action and Proposed Action Alternatives were compared to one another in order to assess the potential impact of the additional CRJ operations in 2011. [Figure B-3.9](#) depicts the 2011 No-Action Alternative noise contours and [Figure B-3.10](#) depicts the 2011 Proposed Action noise contours. The contours were superimposed over the local land use map, and acreage was calculated.

There are no residential land uses or noise sensitive sites within the CNEL 65 dB contour for either the No-Action or the Proposed Action alternatives. [Table B-3.14](#) identifies land use and acreage within the CNEL 65 dB contours for 2011 No-Action and Proposed Action Alternatives.

TABLE B-3.14
2011 NO-ACTION AND PROPOSED ACTION ALTERNATIVES IMPACTS TO LAND USE (ACRES)

Off-Airport Land Use	No-Action Alternative				Proposed Action			
	CNEL 65 dBA	CNEL 70 dBA	CNEL 75 dBA	Total	CNEL 65 dBA	CNEL 70 dBA	CNEL 75 dBA	Total
Public/Quasi-Public Facilities	0.4	0.0	0.0	0.4	0.5	0.0	0.0	0.5
Right of Way	0.2	0.0	0.0	0.2	0.2	0.0	0.0	0.2
Off-Airport Land Use Total	0.6	0.0	0.0	0.6	0.7	0.0	0.0	0.7
On-Airport Land Use	CNEL 65 dBA	CNEL 70 dBA	CNEL 75 dBA	Total	CNEL 65 dBA	CNEL 70 dBA	CNEL 75 dBA	Total
	CNEL 65 dBA	CNEL 70 dBA	CNEL 75 dBA	Total	CNEL 65 dBA	CNEL 70 dBA	CNEL 75 dBA	Total
Public/Quasi-Public Facilities	51.2	24.1	9.8	85.1	51.4	24.2	9.9	85.5
On-Airport Land Use Total	51.2	24.1	9.8	85.1	51.4	24.2	9.9	85.5
GRAND TOTAL	51.8	24.1	9.8	85.7	52.1	24.2	9.9	86.2

Source: URS Corp., 2010.

Note: Numbers may not add, due to rounding.

Units = acres.

Potential 2015 Impacts

No-Action and Proposed Action alternatives were compared in order to assess the potential impact of the CRJ operations in 2015. [Figure B-3.11](#) depicts the 2015 No-Action Alternative noise contours and [Figure B-3.12](#) depicts the 2015 Proposed Action noise contours. The contours were superimposed over the local land use map, and acreage was calculated.

There are no residential land uses or noise sensitive sites within the CNEL 65 dB contour for either the No-Action or the Proposed Action Alternatives. [Table B-3.15](#) identifies land use and acreage within the CNEL 65 dB contours for 2015 No-Action and Proposed Action alternatives.

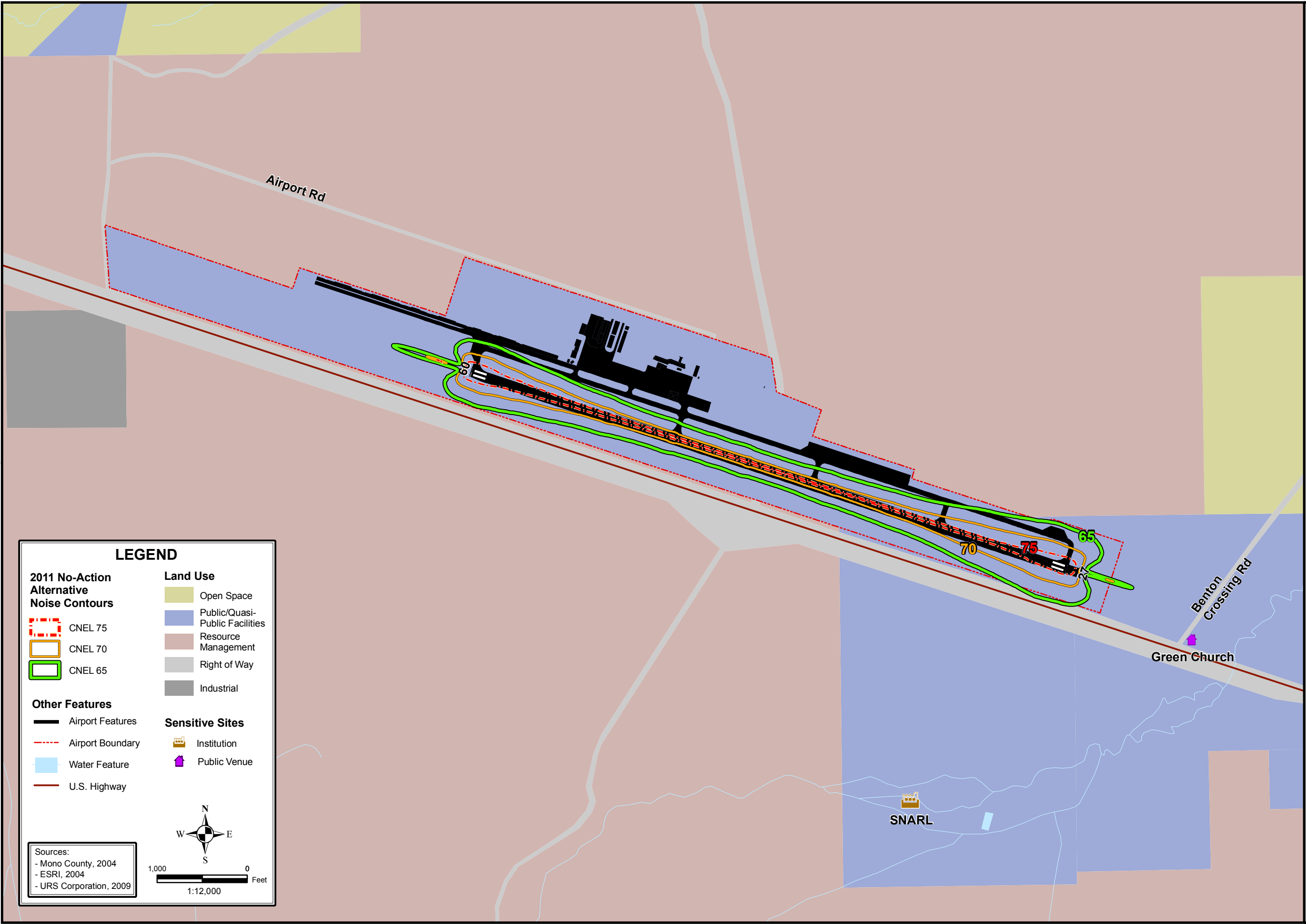
TABLE B-3.15
2015 NO-ACTION AND PROPOSED ACTION IMPACTS TO LAND USE (ACRES)

Off-Airport Land Use	No-Action Alternative				Proposed Action			
	CNEL 65 dBA	CNEL 70 dBA	CNEL 75 dBA	Total	CNEL 65 dBA	CNEL 70 dBA	CNEL 75 dBA	Total
Public/Quasi-Public Facilities	0.5	0.0	0.0	0.5	0.5	0.0	0.0	0.5
Right of Way	0.3	0.0	0.0	0.3	0.3	0.0	0.0	0.3
Off-Airport Land Use Total	0.8	0.0	0.0	0.8	0.8	0.0	0.0	0.8
On-Airport Land Use	CNEL 65 dBA	CNEL 70 dBA	CNEL 75 dBA	Total	CNEL 65 dBA	CNEL 70 dBA	CNEL 75 dBA	Total
Public/Quasi-Public Facilities	52.2	24.8	10.3	87.3	52.3	24.9	10.3	87.5
On-Airport Land Use Total	52.2	24.8	10.3	87.3	52.3	24.9	10.3	87.5
GRAND TOTAL	53.0	24.8	10.3	88.1	53.1	24.9	10.3	88.3

Source: URS Corp., 2010.

Note: Numbers may not add, due to rounding.

H:\projects\Mammoth_Lakes\EA\12009122\Applications\Figures\Draft\Appendix Figure B-3.9, 2011 No-Action Alternative Noise Contours.mxd, [pdf, hde, 03/16/10]



LEGEND

2011 No-Action Alternative Noise Contours

- CNEL 75
- CNEL 70
- CNEL 65

Other Features

- Airport Features
- Airport Boundary
- Water Feature
- U.S. Highway

Land Use

- Open Space
- Public/Quasi-Public Facilities
- Resource Management
- Right of Way
- Industrial

Sensitive Sites

- Institution
- Public Venue

Sources:

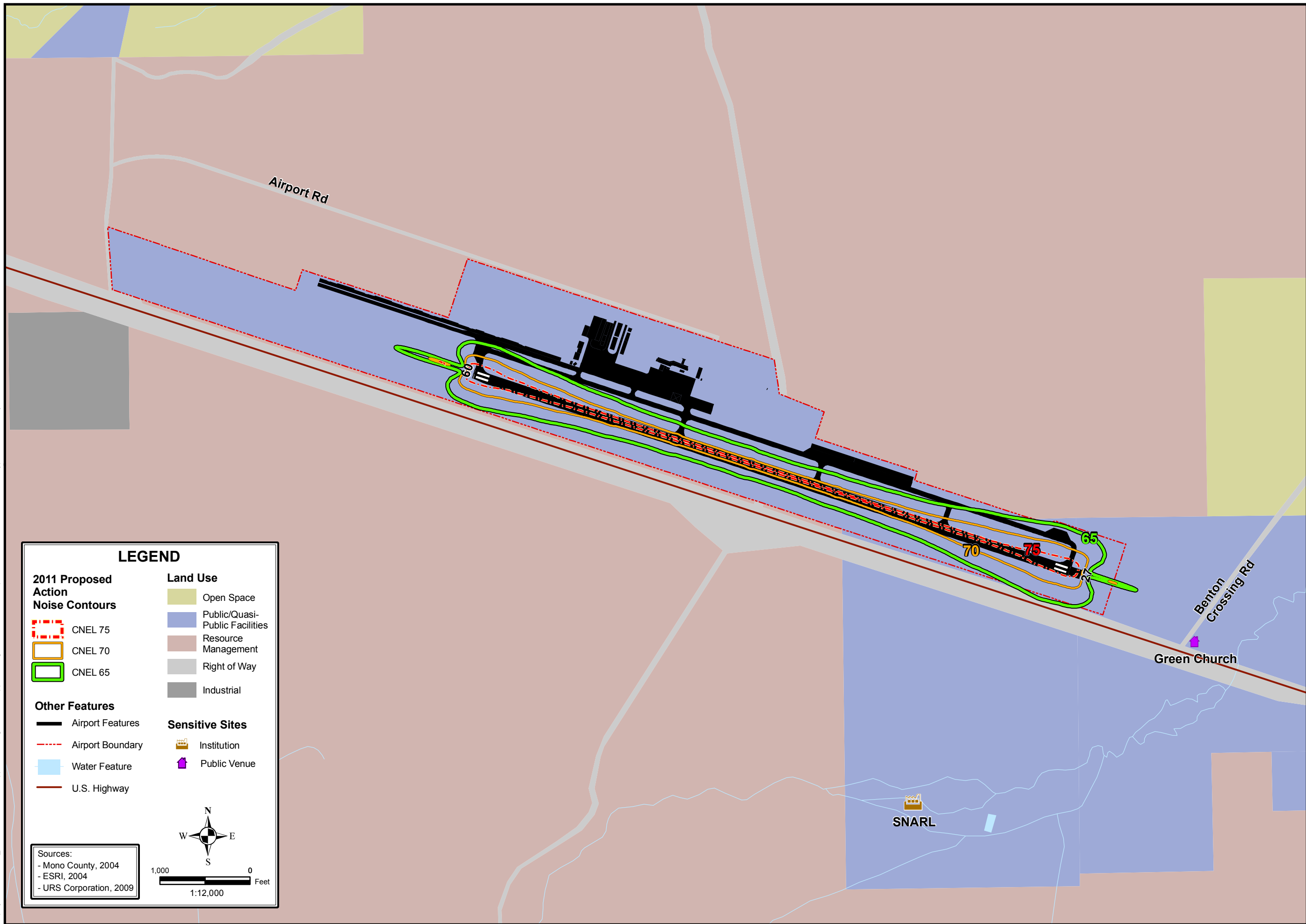
- Mono County, 2004
- ESRI, 2004
- URS Corporation, 2009

1,000 0
1:12,000 Feet

2011 NO-ACTION
ALTERNATIVE NOISE CONTOURS

FIGURE
B-3.9

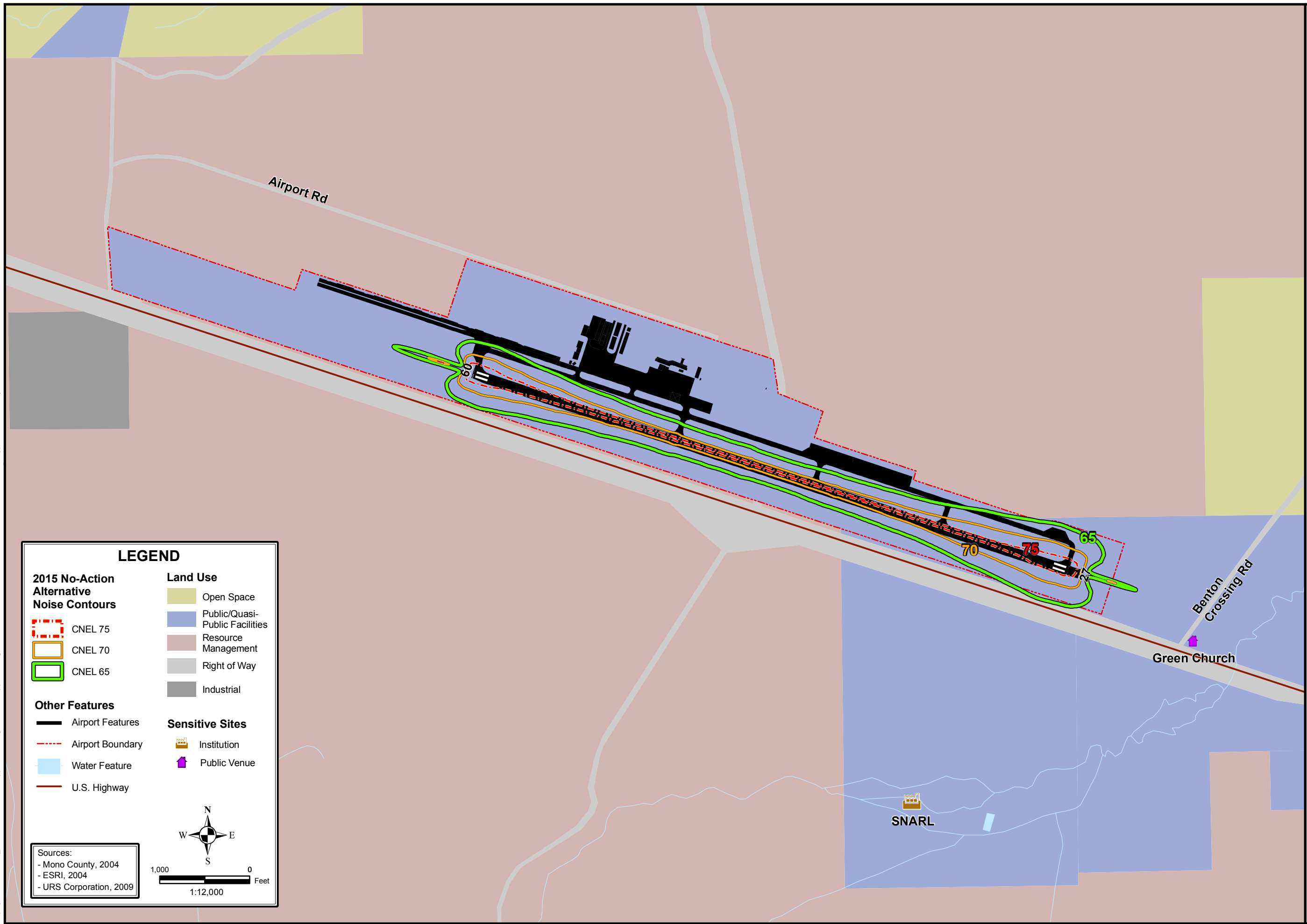
H:\projects\Mammoth_Lakes\EA\12009122\Applications\Figures\Draft\Appendix\Figure B-3.10, 2011 Proposed Action Noise Contours.mxd, (pdf, hde, 03/16/10)



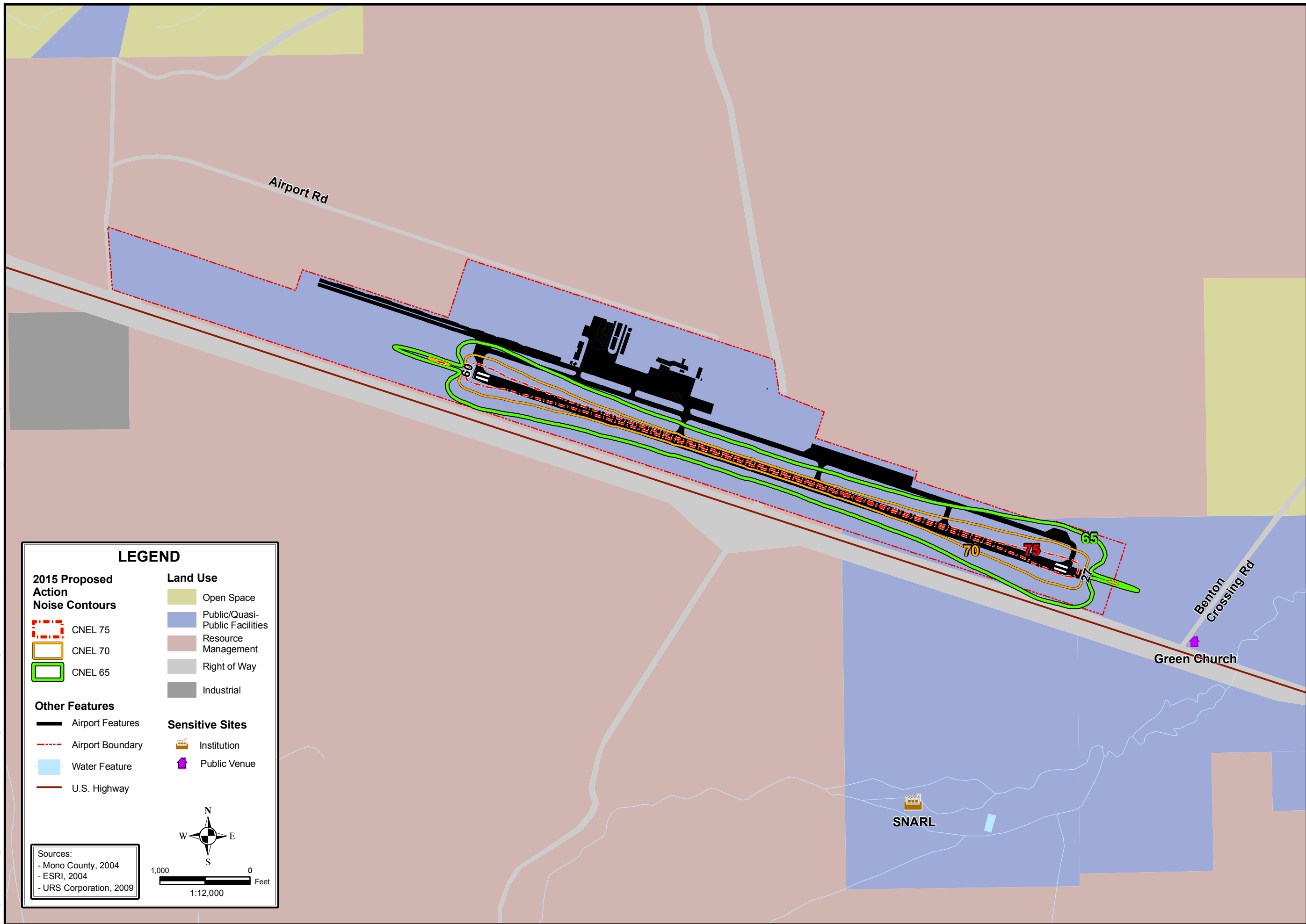
**2011 PROPOSED ACTION
NOISE CONTOURS**

**FIGURE
B-3.10**

H:\projects\Mammoth_Lakes\EA\12009122\Applications\Figures\Draft\Appendix Figure B-3.11, 2015 No-Action Alternative Noise Contours.mxd, (pdf, hde, 03/16/10)



H:\projects\Mammoth_Lakes\EA\12009122\Applications\Figures\Draft\Appendix\Figure B-3.12, 2015 Proposed Action Noise Contours.mxd, (pdf, hde, 03/16/10)



**2015 PROPOSED ACTION
NOISE CONTOURS**

FIGURE
B-3.12

B-4 REFERENCES

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