



NIGHT OPERATIONS AT TRUCKEE TAHOE AIRPORT

**Airport Community Advisory Team
January 13, 2015**

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INTRODUCTION

This paper attempts to assess the scale of night operations at the Truckee Tahoe Airport, to project what future rates may be, and to suggest proportionate and effective options for managing growth. For many years, Truckee Tahoe Airport has used operational data, but there has never been a comprehensive examination specific to night operations. This paper therefore brings together

- an analysis of a broad set of data on curfew non-compliance from 2011 through 2013;
- an analysis of data on activity after dark during peak winter and summer season in 2013-2014
- Master Plan projections for activity at the Airport in the future;
- industry literature; and
- prior studies and memoranda prepared for the Board and ACAT on night operations and related topics.

The methodology for collecting data is described in more detail in appendix A. For economic analyses and projections, the study relies on work performed for the Master Plan, as encapsulated in the Master Plan's activity projections. More detailed study could be done, with outside assistance, in a second phase of the project if desired.

Based upon the work above, the paper concludes that night operations at the airport are few but increasing, and that the increase is likely to continue. It therefore recommends that the Board take action now, in the form of measures a. – g. listed on page 6.

PRELIMINARIES

DEFINING "NIGHT"

The word "night" can give rise to confusion. Aviators use it for periods with certain natural light conditions; laypeople tend to think in terms of the clock and cultural norms—neither of which has a fixed relation to light conditions. Since this study considers, among other things, how aircraft capabilities for flying during aviation "night" may affect operations patterns during what district residents consider to be "night," more precise language is essential.

For clarity, then, this paper reserves the term "night" for the period between 10:00 p.m. and 7:00 a.m., that is, to a period when residents generally expect quiet. In doing so, it maintains consistency with the usage of "night" in the District's surveys of residents, as well as with FAA and State of California metrics for noise evaluation¹ and local noise

¹ Federal Aviation Administration, "Noise," Chapter 17 in *Environmental Desk Reference for Airport Actions* (Washington D.C.: Federal Aviation Administration, 2007), 1-2 and note 2.

standards.² The time in between the end of aviation daylight conditions in the evening and the beginning of aviation daylight conditions in the morning as defined in the Federal Aviation Regulations³ will be referred to as “darkness.”

CHALLENGES OF FLYING IN DARKNESS

It has been estimated that “not quite 5% of the flying takes place” at night⁴ with “nearly 30% of the fatalities and an additional 15% of the non-fatal accidents occurring at night.” Also “Ten-times as many accidents occurring on dark nights as with moon light.” Per a 2005 AVWeb article⁵ “almost every night or weather accident occurred in mountainous terrain” and “In the 2003 Nall report, 21.6% of fatal accidents (US wide) occurred at night vs. the Bay Area, where fully 43% of fatal accidents occurred at night.” While the focus of the referenced article concentrates on the Bay Area, it seems logical to state that we host many of the same aviators who struggle in that environment in our even more challenging environment.

STUDY CONTEXT

Nighttime aircraft operations disturb surrounding communities more than similar operations during the day. The FAA’s prescribed method for calculating an airport’s noise impact penalizes operations between 10:00 p.m. and 7:00 a.m. by 10 decibels. According to the FAA, operations during this period contribute heavily to an airport’s overall noise profile.⁶

Moreover, although the absolute number of night operations at Truckee is not large now, district residents are concerned about an increase. Both 2013 Godbe survey and the workshops conducted for the Master Plan Update show that a large majority supports a curfew between 10:00 pm and 7:00 am.⁷ Master Plan workshop participants,

² Placer County reduces acceptable sound levels during “nighttime,” defined as 10:00 p.m. to 7:00 a.m. (Placer County Code 9.36.060 Table 1); Nevada County reduces acceptable sound levels in rural and residential areas from 7:00 pm to 10:00 pm and further reduces them from 10:00 p.m. to 7:00 a.m. (Nevada County Code Sec. L-II 4.1.7 Table). Truckee applies State of California law on noise. In addition, a number of homeowners’ associations within the District expand on county or municipal quiet hours with their own rules, typically directed at construction activities. For example, Lahontan and Martis Camp forbid construction between 6 p.m. (5 p.m. in winter) and 7 a.m. on weekdays; Northstar and Tahoe-Donner forbid construction between 7 p.m. and 7 a.m. on weekdays, and Glenshire forbids construction between 8 p.m. and 7 a.m. on weekdays. In all these neighborhoods, noise restrictions were extended on weekends.

³ 14 C.F.R. §1.1 (F.A.R. §1.1).

⁴ “Fixed Wing Training: Flying at Night,” *Pilot Friend*, accessed July 31, 2014, http://www.pilotfriend.com/training/flight_training/fxd_wing/nightfly.htm.

⁵ Trescott, M., “Regional Accident Analysis: Know Your Local Risk Factors,” *AVWeb*, May 4, 2005, <http://www.avweb.com/news/safety/189630-1.html?redirected=1>.

⁶ Federal Aviation Administration, “Noise,” chapter 17 in *Environmental Desk Reference for Airport Actions*, October 2007, 1-2.

⁷ Godbe Research, “Truckee Tahoe Airport District Community Survey,” November 2013, 30.

who had an opportunity to rank the importance of various noise abatement issues, place nighttime operations and a curfew among their top priorities.⁸

The Airport currently seeks to reduce night operations through voluntary curfews. It has two curfew periods. All aircraft are asked to comply with a core 11 p.m. – 6:00 a.m. curfew, and hangar tenants at Truckee Tahoe can receive discounts for compliance with that curfew through participation in the Fly Quiet program. Hangar tenants can also receive additional discounts through Fly Quiet if they observe an expanded curfew of 10:30 p.m. – 6:30 a.m. These programs are publicized on the Airport’s website and the great majority of hangar tenants participate in Fly Quiet.

The Airport’s business hours, although based on commercial rather than noise considerations, may also be having an incidental effect on the amount of night activity at Truckee Tahoe. For cost and operational reasons, the Airport provides fueling, tows and other aviation services only between 7 a.m. and 7 p.m. Buildings are secured for the evening at 9:30 p.m. and re-open at 7 a.m. While the airfield remains accessible and partially lit at night, it is possible that some travellers are electing to arrive or depart during normal Airport hours instead for the added safety, comfort and convenience.

OPERATIONAL PATTERNS AND TRENDS AT TRUCKEE TAHOE

Traditionally, the Airport has relied on the surrounding terrain and on operator specifications (ops specs) to constrain night operations.⁹ And to date annual operations at night have numbered in the dozens. An examination of operational data, however, suggests that circumstances may be more complex and less stable than previously assumed.

Curfew violating operations, for example, show a significant amount of growth. In 2013, 39 non-medical operations took place from 11:00 pm to 6:00 am.¹⁰ This number represents an increase of 39.3% over the prior year. 2012 also saw growth as compared to 2011, albeit at a more modest 12.0%. For comparison, overall operations increased year on year by only 0.48% in 2013 and 3.6% in 2012.¹¹ Night operations are becoming a larger proportion of activity at the Airport.

One reason for the greater rate of increase in activity at night, as compared to the general growth in operations, seems to lie in the changing character of the fleet mix at Truckee Tahoe, a phenomenon noted in the Master Plan. The great majority of operations disregarding the curfew are by transient, not based, aircraft, and this is a group projected

⁸Truckee Tahoe Airport, “Master Plan Update Process: Community Outreach Summary Report,” May 2013, 11.

⁹ See, e.g., appendix F.

¹⁰ See appendix B.

¹¹ Memorandum by Hardy Bullock, “Community Comments & Operations Report – 4th Quarter,” January 22, 2014, Truckee Tahoe Airport Board Materials; Memorandum by Hardy Bullock, “Community Comments & Operations Report – 4th Quarter,” January 24, 2013, Truckee Tahoe Airport Board Materials.

to grow over the course of the next 20 years.¹² Jet and turboprop aircraft are also increasing, suggesting a shift toward more business-type operations with staff pilots. These operations seem likely to prioritize passenger convenience over Airport noise sensitivity requests. When asked during an informal survey, charter, corporate and fractional operators confirmed that, with one significant exception discussed below, they would (and do) operate at Truckee-Tahoe at whatever hour a client wishes.¹³ In addition, business operations reposition aircraft much more frequently than individual operators, leading to multiple operations for a single travel event.¹⁴ This is a very different mode of activity from the locally-based, personal aircraft the Airport currently targets in its noise abatement incentive programs.

The spread of more advanced IFR technology likely contributes to an increasing growth rate as well. To date, the prevailing view has been that the terrain surrounding the Airport is a strong constraint on operations after dark.¹⁵ But although there are relatively few operations during the night, Truckee-Tahoe does have hundreds of arrivals and departures in darkness.¹⁶ Most of these are either turboprops or jets, which typically carry more advanced avionics suites, but a substantial number of piston aircraft also fly in darkness. The pattern of operations during winter peak season in 2013-2014 illustrates the phenomenon well: darkness fell before 6:00 p.m. but arrivals and departures by all kinds of aircraft remained lively until around 8:00 p.m.¹⁷ One new technology that facilitates flying in darkness, synthetic vision, is already common and seems likely to become standard in the coming years. While still an optional feature on even high-end avionics suites, most business aircraft built or retrofitted since 2011 or 2012 carry it.¹⁸ Pilots who lack synthetic vision on their aircraft but consider it critical to flying into Truckee at night have been able to get mobile versions quickly and inexpensively since 2011.¹⁹ Other, perhaps even more significant technologies include advanced navigational procedures and aids not yet present at Truckee Tahoe. The advent of Next Gen satellite navigation technologies is advancing quickly nationwide. As one example of the impact of Next Gen technologies, development of an RNP procedure at Juneau allowed a

¹² See appendices B and D.

¹³ See appendix C.

¹⁴ See appendix E.

¹⁵ See appendix F.

¹⁶ See appendix E.

¹⁷ Ibid.

¹⁸ Ed McKenna, "Synthetic Vision Systems," *Avionics Today*, May 1, 2012, http://www.aviationtoday.com/av/issue/feature/Synthetic-Vision-Systems_76212.html#.U7icmFbOYVs

¹⁹ Jason Paur, "iPad App Gives Pilots Cheap Synthetic Vision," *Wired*, July 27, 2011, <http://www.wired.com/2011/07/ipad-app-gives-pilots-cheap-synthetic-vision/>; Dave Hirschman, "Garmin's iPad killer: 3D Vision in a Pure Aviation GPS," *AOPA*, September 14, 2011, <http://www.aopa.org/News-and-Video/All-News/2011/September/14/Garmin's-iPad-killer>. Night vision goggles, another tool for flying in darkness, are used primarily by medical and military operations.

commercial carrier to begin operating in instrument conditions there despite terrain.²⁰ And a major operator at Truckee-Tahoe says that it would operate in darkness here if there were vertical guidance.²¹ The bulk of the impact from technological change may still be coming.

Aside from growth, the data reveals another interesting pattern in night operations: concentration. There is a seasonal surge in late night (that is, early morning) operations every summer. Operations between 3:00 a.m. and 6:00 a.m. form a steady 45% of the annual operations disregarding the core curfew, yet they are almost entirely confined to the period from June to September.²² As a result, summer nights are significantly noisier than winter ones. Night operations are also concentrated spatially, clustering on Runway 29.²³ They are therefore likely to have a disproportionately large effect on certain neighborhoods. As a result, the perceived noise may be more intense than annualized night operation rates would suggest.

Should these patterns remain in place, the Airport can expect night operations to become more prominent. They seem likely to grow at least as fast as operations at the Airport, and perhaps faster if the fleet mix continues to shift toward business-type flights and if Next Gen technologies make night operations safer. Moreover, the populations most associated with the growth—transient and business operators, and their passengers—are not covered by current Airport incentive programs, nor are passengers targeted in current outreach programs.

RECOMMENDATIONS

Because the volume and character of night operations is changing, the Board should consider adjusting the Airport's approach. Any discussion of measures relating to noise abatement must consider the regulatory framework, on which outside legal counsel Peter Kirsch briefed ACAT in 2014. Mandatory rules must meet the formidable requirements of Part 161 of the Federal Aviation Regulations.²⁴ In 2006, ACAT studied whether the Airport should undertake the effort, and concluded that the cost would be

²⁰ Federal Aviation Administration, "NextGen Saves the Day in Juneau," October 2013, <http://www.faa.gov/nextgen/snapshots/stories/?slide=10>.

²¹ See appendix C.

²² See appendix B.

²³ Ibid.

²⁴ 14 C.F.R. §161. In 2012, in support of future recommendations to Congress on federal regulatory changes and funding apportionment policies, the FAA released a document categorizing all U.S. general aviation airports (GA airports). Truckee Tahoe, along with Minden Tahoe and Carson City, were designated as second-tier or "regional" airports, deemed by the FAA to support regional economies. South Lake Tahoe were designated a third-tier or "local" airport. The FAA's criteria were airport location and benchmarks for volume and character of aviation activity. Federal Aviation Administration, *General Aviation Airports: A National Asset*, (Washington, D.C.: Federal Aviation Administration 2012), 3, 12, 23, 26 and appendix B2. http://www.faa.gov/airports/planning_capacity/ga_study/media/2012AssetReport.pdf.

very high, while the likelihood of success was very low.²⁵ Since that study, the regulatory landscape has remained largely the same and no airport has succeeded in leaping the regulatory hurdle, although several have tried. ACAT therefore did not consider measures to restrict access to the Airport. A mandatory curfew is not proposed. Instead, ACAT recommends that the Airport refine and supplement its current voluntary programs and outreach efforts such that they reach all populations by implementing the following measures.

- a. Enhance Unicom protocols to require outreach to all potential night operations of which the Airport becomes aware, such outreach to request compliance with curfew hours and to inform pilots, operators and/or passengers of the safety concerns, heightened noise sensitivity, and limited services available during night hours.
- b. Publicly thank users who change their flight plan to avoid operating at night.
- c. Install signage in the terminal, at gates, and in other high-traffic areas to communicate directly with passengers, as well as pilots and operators, on noise sensitivity and quiet hours.
- d. Create a formal District Policy requiring assessment of the potential impact on night operations of contemplated changes or additions to airport services, facilities, and/or navigational aids or procedures, and requiring Board review and approval of the night operations impact before the Airport commits itself to a change or addition.
- e. Unify Fly Quiet program curfew hours and general voluntary curfew hours so that the Airport has a single voluntary curfew period, for consistent communications and ease of administration.
- f. Conform curfew hours to night hours (10 p.m. to 7 a.m.).
- g. Develop a financial incentive program for curfew-compliant transient operators.

These measures can be implemented separately or in concert. Most are low-cost.

CONCLUSIONS

Night-time activity and related curfew non-compliance are increasing at Truckee Tahoe. Transient and business-type operations, which are more likely to fly during curfew hours, represent a growing portion of activity at the Airport. Darkness and terrain no longer bar operations as firmly as once they did, and new navigational technologies may make night operations here still less daunting. There are a number of non-restrictive measures available to the Airport that might help offset these trends, including supplementing current pilot incentives and reaching out to passengers, who often have a

²⁵ See appendix G.

strong influence on operation times. These measures should be implemented at this time, and night operation rates should be reviewed twelve to twenty-four months after implementation to determine whether further action is appropriate.

APPENDIX A: DATA METHODOLOGY

OPERATIONS DATA CAPTURE HISTORY

Capturing operations data at Truckee Tahoe Airport has evolved significantly over the past ten years. Early on, operational estimates were based on sale of fuel, overnight parking, and associated goods and services sold. While it is a broad approach, this methodology continues to be used for reference and is a valuable guideline for estimation purposes. Software for personnel to manually count operations was used for several years in mid-2000 where the operator would physically count planes. The human factors and number of distractions in Unicom made this type of data gathering questionable in terms of accuracy.

In 2007, the District procured an automated system to capture operations. The WASP system is a group of four cameras that capture aircraft taxiing to or from a runway end. The supporting software analyzes tail numbers and assigns the type and time of operation. This system has been an excellent tool for capturing departures that taxi past the cameras. Quarterly and annual operational counts are based on the number of departures captured. An operation is defined as an arrival or departure. Departures are then doubled for operational reporting purposes. Estimations for transient helicopter, touch and go, and glider activity have supplemented the WASP system, since they are not captured by the cameras.

While the District has owned a flight-tracking system for several years, the use of WAM (wide-area multi-lateration) data has not been used for operations reporting. Until recently, the fusion of the camera data and MLAT (multi-lateration) data has not been available. Thus, all operations data has been estimation based on observations, sales, and the tools available during the reporting periods.

DATA USED FOR NIGHT OPS

The Night Ops subcommittee decided to use data from all available resources for the Night Ops Study. Those resources include the Complaint Database, the WASP system, and the MLAT system. The benefits include detailed observations of arrivals and overflights, which are not available when extrapolating data from the WASP system alone. The use of all data sources paints a significantly more accurate depiction of Night Operations at KTRK since it utilizes all available resources to accurately determine the time and type of operation.

Staff queried each distinct data repository for all times periods studied in the report and corrected the final product to remove any duplicates and ensure that all operations reported are accurate. The compilation of data sets are represented within the Night Ops document and may not synch entirely with previously reported data sets from Board Meetings or the Master Plan figures. Since the task of the subcommittee was to

look granularly at night operations, the most detailed data views were chosen for reporting purposes.

Each operation reported within this document can be verified. No estimations were used for observations.

APPENDIX B: OPERATIONS, 11:00 P.M. - 6:00 A.M., 2011 - 2013

TABULAR DATA

Date	Day (Local)	Time (Local)	Arrive/Depart	RWY	Type	Aircraft	Local/Transient	Comp-laint	Comment	Counts
2013										
1/1/2013	Tuesday	11:09 PM	A	29	J	Cessna Citation 560	Transient			1
1/27/2013	Sunday	11:24 PM	A	20	TP	Pilatus PC12	Transient			1
1/27/2013	Sunday	11:35 PM	D	29	TP	Pilatus PC12	Transient			1
3/28/2013	Thursday	11:25 PM	D	29	Unk	Unk	Unk			1
4/2/2013	Tuesday	11:34 PM	A	29	Unk	Unk	Unk			1
5/13/2013	Monday	11:06 PM	D	11	P	Cessna T206	Transient			1
5/15/2013	Wednesday	5:25 AM	D	29	P	Cessna T210	Local	Y		1
5/22/2013	Wednesday	11:18 PM	A	29	Unk	Unk	Unk			1
5/31/2013	Friday	5:48 AM	D	29	P	Mooney M20K	Transient			1
6/3/2013	Monday	11:01 PM	A	20	Unk	Unk	Unk			1
6/5/2013	Wednesday	5:40 AM	D	11	Unk	Unk	Unk			1
6/5/2013	Wednesday	11:05 PM	D	29	Unk	Unk	Unk			1
6/5/2013	Wednesday	11:47 PM	D	11	Unk	Unk	Unk			1
6/7/2013	Friday	1:43 AM	A	11	Unk	Unk	Unk			1
6/8/2013	Saturday	11:24 PM	A	29	Unk	Unk	Unk			1
6/10/2013	Monday	11:41 PM	A	20	Unk	Unk	Unk			1
6/13/2013	Thursday	11:03 PM	A	11	Unk	Unk	Unk			1
6/29/2013	Saturday	11:12 PM	A	11	TP	KA 200	Transient		Medical	1
6/30/2013	Sunday	1:47 AM	D	2	TP	KA 200	Transient		Medical	1
7/8/2013	Monday	5:47 AM	D	11	Unk	Unk	Unk			1
7/10/2013	Wednesday	11:36 PM	A	11	P	Mooney M20K	Transient			1
7/11/2013	Thursday	5:47 AM	D	29	P	Cessna 182	Transient			1
7/14/2013	Sunday	11:16 PM	A	29	P	Cessna T210	Local			1
7/15/2013	Monday	11:01 PM	D	29	J	Lear 35A	Transient	Y x2	Medical	1
7/29/2013	Monday	5:58 AM	D	20	Unk	Unk	Unk			1
8/1/2013	Thursday	12:19 AM	A	29	TP	Pilatus PC12	Transient			1
8/2/2013	Friday	5:31 AM	D	29	Unk	Unk	Unk			1
8/4/2013	Sunday	5:45 AM	D	29	Unk	Unk	Unk			1
8/5/2013	Monday	4:16 AM	A	11	J	Cessna 750	Transient			1
8/5/2013	Monday	5:38 AM	D	11	J	Cessna 750	Transient			1
8/25/2013	Sunday	11:11 PM	D	29	J	Gulfstream G-IV	Transient			1
8/27/2013	Monday	5:31 AM	A	29	J	Cessna 525B	Transient			1
8/27/2013	Monday	6:00 AM	D	29	J	Cessna 525B	Transient	Y		1
8/28/2013	Wednesday	5:33 AM	D	29	P	Diamond DA40	Transient			1
8/30/2013	Friday	5:03 AM	D	11	Unk	Unk	Unk			1
8/30/2013	Friday	5:03 AM	A	20	P	Beech V35	Transient			1

Date	Day (Local)	Time (Local)	Arrive/ Depart	RWY	Type	Aircraft	Local/ Transient	Complaint	Comment	Counts
9/14/2013	Saturday	5:38 AM	D	2	P	Beech V35	Transient			1
9/20/2013	Friday	11:27 PM	D	20	P	Cessna 340	Transient			1
9/27/2013	Friday	11:27 PM	A	20	Unk	Unk	Unk			1
10/7/2013	Monday	1:34 AM	A	29	P	Cessna T210	Local			1
10/19/2013	Saturday	6:00 AM	D	29	P	Cessna 414	Transient			1
10/22/2013	Tuesday	12:25 AM	A	11	P	KA C90	Transient			1
6 repeater ACFT							2 Local	4, 0 repeat		42
2012										
1/27/2012	Friday	10:56 PM	D	20	TP	Piper PA-31T	Transient		Medical	1
4/17/2012	Tuesday	12:13 AM	D	11	Unk	Unk	Unk			1
4/20/2012	Friday	11:59 PM	A	29	P	Cessna T210	Local			1
4/28/2012	Saturday	1:27 AM	D	Unk	Unk	Unk	Unk			1
5/9/2012	Wednesday	12:40 AM	D	29	H	Eurocopter A-Star	Transient		Medical	1
5/14/2012	Monday	5:39 AM	D	2	Unk	Unk	Unk			1
5/22/2012	Tuesday	11:11 PM	A	20	H	Eurocopter A-Star	Transient		Medical	1
5/22/2012	Tuesday	11:29 PM	D	20	H	Eurocopter A-Star	Transient		Medical	1
5/29/2012	Tuesday	12:12 AM	D	11	Unk	Unk	Unk			1
6/4/2012	Monday	12:10 AM	A	29	H	Eurocopter EC130	Transient		Medical	1
6/4/2012	Monday	5:36 AM	D	20	Unk	Unk	Unk			1
6/8/2012	Friday	11:23 PM	A	20	Unk	Unk	Unk			1
6/15/2012	Friday	5:12 AM	D	11	TP	KA200	Transient			1
6/21/2012	Thursday	5:33 AM	D	29	P	Cessna P210	Transient			1
6/25/2012	Monday	12:11 AM	A	20	Unk	Unk	Unk			1
6/28/2012	Thursday	5:59 AM	D	29	TP	KA200	Transient			1
7/6/2012	Friday	5:47 AM	D	11	TP	KA200	Transient			1
7/6/2012	Friday	6:00 AM	D	2	P	Cessna T210	Local			1
7/30/2012	Monday	4:36 AM	D	29	Unk	Unk	Unk			1
8/2/2012	Thursday	5:35 AM	D	2	TP	KA200	Transient			1
8/3/2012	Friday	5:44 AM	D	20	Unk	Unk	Unk			1
8/3/2012	Friday	5:47 AM	D	20	P	Cessna T210	Transient			1
8/7/2012	Tuesday	5:34 AM	D	2	TP	KA200	Transient			1
8/11/2012	Saturday	11:53 PM	D	20	Unk	Unk	Unk			1
8/13/2012	Monday	5:59 AM	D	2	TP	KA C90	Transient			1
8/20/2012	Monday	12:27 AM	A	20	Unk	Unk	Unk			1
9/2/2012	Thursday	11:32 PM	A	20	Unk	Unk	Unk			1
9/7/2012	Friday	11:15 PM	A	20	Unk	Unk	Unk			1
9/10/2012	Monday	11:23 PM	A	20	Unk	Unk	Unk			1
9/15/2012	Saturday	1:06 AM	A	2	TP	TBM	Local			1
9/29/2012	Saturday	11:31 PM	A	29	TP	TBM	Local			1
10/26/2012	Friday	2:47 AM	A	29	J	Eclipse EA500	Transient			1

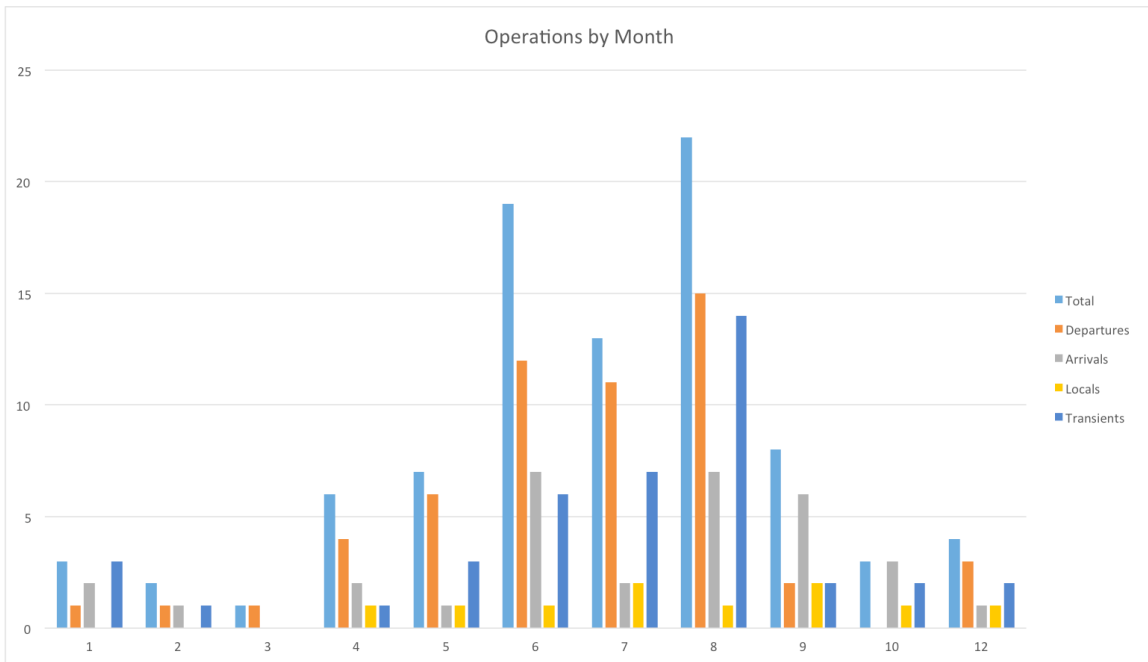
Date	Day (Local)	Time (Local)	Arrive/Depart	RWY	Type	Aircraft	Local/Transient	Complaint	Comment	Counts
12/25/2012	Tuesday	11:24 PM	D	29	TP	KA 200	Transient			1
3 repeater ACFT							2 Local	0		33
2011										
2/1/2011	Tuesday	11:45 PM	A	29	P	Cessna 421P	Transient			1
2/11/2011	Friday	11:48 PM	D	Unk	Unk	Unk	Unk			1
3/17/2011	Thursday	11:15 PM	U	Unk	Unk	Unk	Unk	Y	No Track, No WASP	1
4/2/2011	Saturday	12:05 AM	D	29	P	Piper PA28	Transient			1
4/25/2011	Monday	11:15 PM	D	Unk	Unk	Unk	Unk			1
5/26/2011	Thursday	11:47 PM	D	29	TP	KA300	Transient			1
6/19/2011	Sunday	5:45 AM	D	29	P	Cessna 172	Transient			1
6/22/2011	Wednesday	5:48 AM	D	11	P	Cessna 182	Transient			1
6/22/2011	Wednesday	5:43 AM	D	11	P	Cessna 177	Transient			1
6/23/2011	Thursday	5:54 AM	D	2	P	Cessna 182	Local			1
6/24/2011	Friday	5:50 AM	D	2	Unk	Unk	Unk			1
7/1/2011	Friday	12:16 AM	D	29	Unk	Unk	Unk			1
7/1/2011	Friday	12:20 AM	D	29	TP	Pilatus PC12	Transient			1
7/21/2011	Thursday	5:51 AM	D	2	P	Beech S35	Local			1
7/26/2011	Tuesday	5:40 AM	D	11	TP	Pilatus PC12	Transient			1
7/27/2011	Wednesday	5:45 AM	D	29	P	Van RV6	Transient			1
7/29/2011	Friday	11:00 PM	D	29	TP	KA200	Transient			1
8/1/2011	Monday	6:00 AM	D	29	P	Mooney M20M	Local			1
8/6/2011	Saturday	5:51 AM	A	29	TP	KA300	Transient			1
8/8/2011	Monday	11:03 PM	A	29	P	Cessna T210	Local			1
8/11/2011	Thursday	11:03 PM	D	29	Unk	Unk	Unk			1
8/11/2011	Thursday	11:00 PM	D	29	TP	KA C90	Transient			1
8/17/2011	Wednesday	5:45 AM	D	11	TP	KA100	Transient			1
9/5/2011	Monday	6:00 AM	U	Unk	Unk	Unk	Unk	Y	No Track, No WASP	1
12/24/2011	Saturday	1:04 AM	A	29	P	Beech Bonanza	Transient			1
12/24/2011	Saturday	1:38 AM	D	29	TP	TBM700	Local			1
12/28/2011	Wednesday	11:07 PM	A	29	TP	Piper Cheyenne	Transient		Medical	1
12/28/2011	Wednesday	11:23 PM	D	29	Unk	Unk	Unk			1
							2, 0			
0 Repeater ACFT							4 Local	repeat		28
9 Repeater ACFT							8 Local	0		103

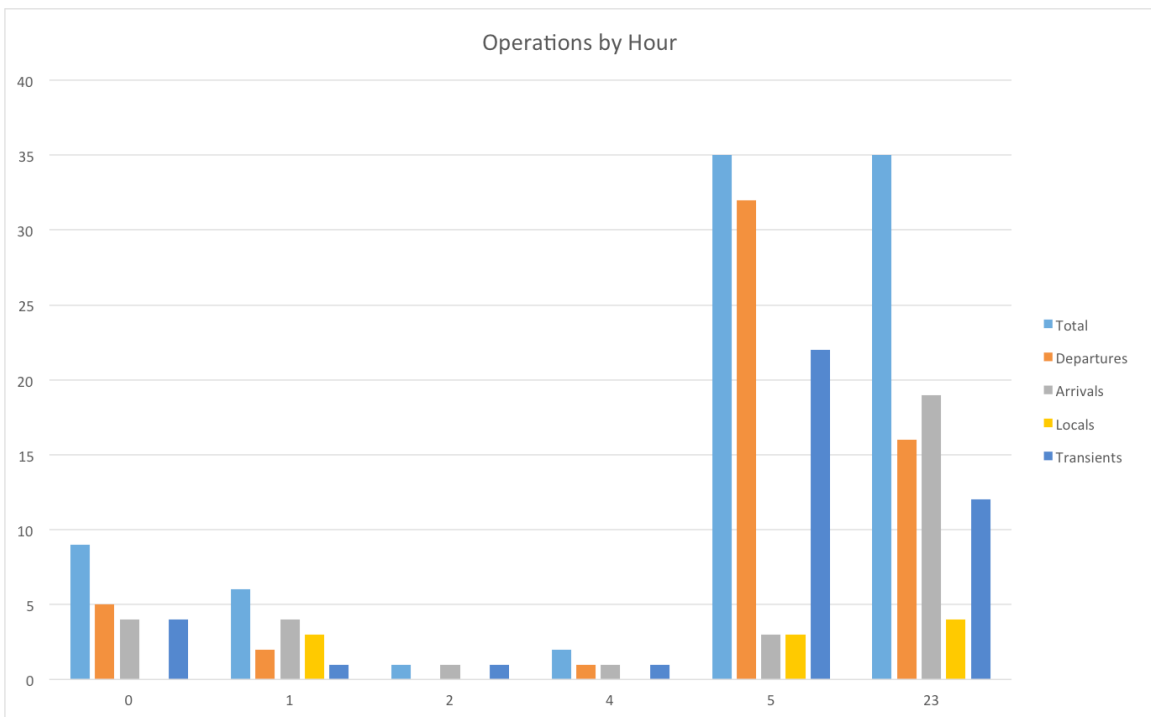
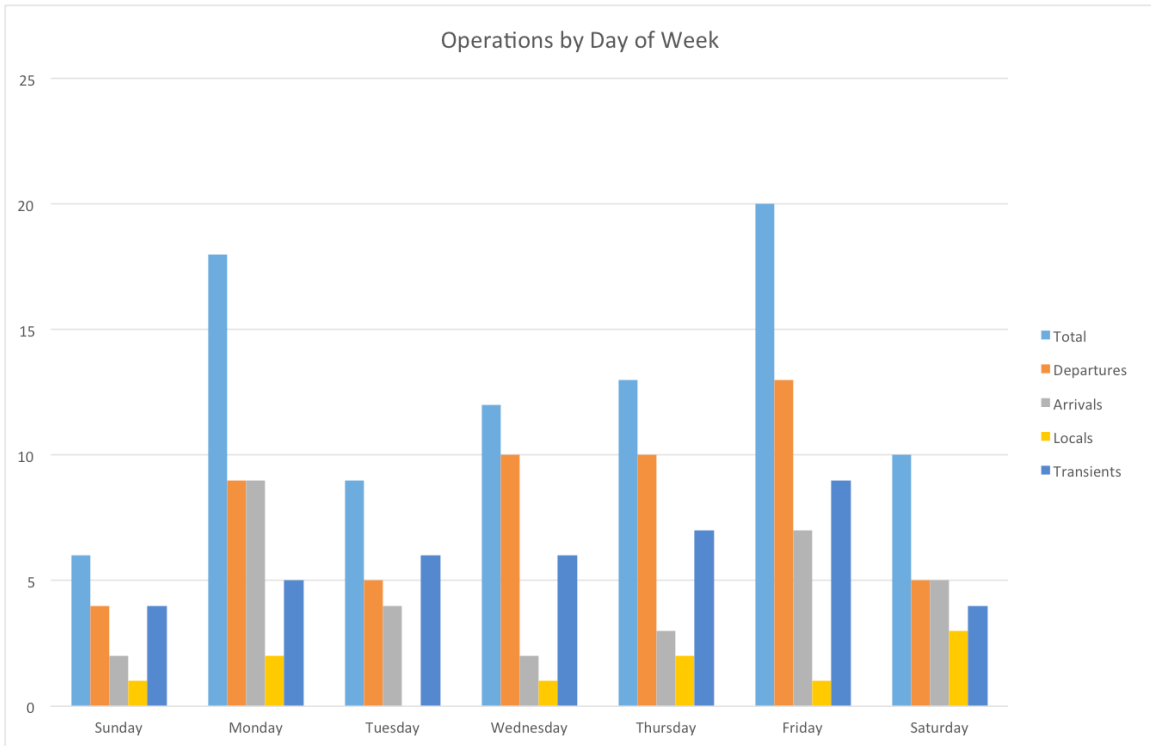
GRAPHS

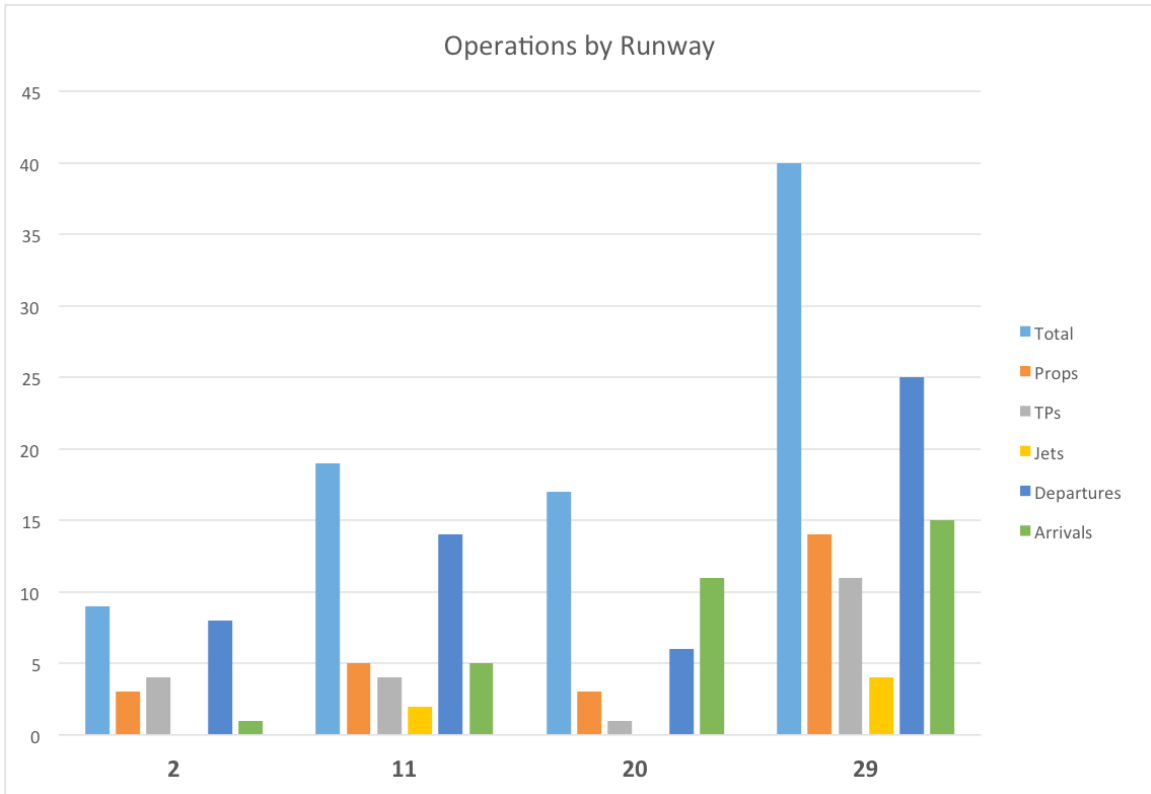
For graphing purposes, some operations have been excluded, i.e.:

- Four operations occurring right at 6:00 a.m., which technically are not curfew non-compliance.
- Nine medical operations, which typically are not considered non-compliant, as are other emergency operations such as law enforcement and fire fighting
- Two calls where no identified aviation-related operation could be identified.

Thirty-seven of the eighty-eight remaining operations graphed had no identification information ('N' Number) and hence neither the type of aircraft nor whether it was local or transient could be determined.







APPENDIX C: NIGHT OPERATIONS SURVEY

by Mike Cooke, June 2014

6 attempts, 4/6 interviews or replies

Does your company fly into to Truckee after dark?

3 NO, 1 YES

Are there company operational or insurance restrictions that shape your decision to fly here after dark?

3 No, 1 Yes, EJA no vertical guidance.

Are there safety issues or personal minimums that contribute to your decision to fly or not fly here after dark?

All: No ILS, Corp1: not an option period. Chrt1 tries to curtail night ops, esp in winter. Chrt2: self-imposed restriction. EJA policy requires vertical guidance.

Does customer demand generally shape operations hours?

All yes, but within operational parameters, ie Corp1 would rather take customers to Reno if they want to come here at night.

Would you like to see enhanced services after dark here? If so what?

All: No, like it the way it is & don't use the night services anyway. Chrt1: we're used to the services as they are, so we don't expect after hours fuel, etc.

If a large hangar were available for overnight use, do you feel it would increase your overnight visits to KTRK?

All: More likely to stay the night even instead of repositioning. Corp1 was even willing to sublease by the month.

Other comments

Summary – all interviewed operators were happy with current situation and would welcome more hangar options for overnight use. Nobody expected increases in night ops or significant changes to schedules.

APPENDIX D: FLEET MIX CHANGES

The Master Plan currently being prepared for Truckee Tahoe Airport includes estimates of operational changes and highlights more turbo-prop and turbo-jet based aircraft:

Table 2-26	2012	2015	2020	2025
	(Actual)			
BASED AIRCRAFT:				
Single-Engine Piston	156	157	158	160
Multi-Engine Piston	12	12	12	12
Turbo-Prop	27	29	34	41
Turbo-Jet	16	18	24	32
Helicopter	6	6	7	8
TOTAL₁	217	222	236	253
OPERATIONS				
Itinerant	14,902	15,687	17,087	18,612
Local	11,568	11,777	12,142	12,527
TOTAL	26,470	27,464	29,229	31,139
PEAK CONDITIONS:				
Peak Month (July)	4,922	5,034	5,244	5,467
(% annual)	(18.60%)	(18.29%)	(17.83%)	(17.36%)
Average Day/ Peak Month	164	168	175	182
Peak Hour (15%)	25	25	26	27

Truckee Tahoe Airport, "Aviation Forecasts," Truckee Tahoe Master Plan (Draft), June 2014, <http://www.ttadmasterplan.org/wp-content/uploads/2014/06/TRK%20AMP%20June%202014%20DRAFT.C2.Forecasts.pdf>

Newer aircraft tend to be better equipped and fleet mix is changing from single-engine pistons (actually decreasing) to high-end airframes that tend to be better equipped. Hence as the aviation market progresses it is likely that the capability of aircraft to operate in darkness will continue to improve and expand. The aircraft will not be a barrier to operating in darkness.

APPENDIX E: OPERATIONS DURING DARKNESS, SELECTED PERIODS OF 2013-2014

TABULAR DATA

JULY-AUGUST 2013

Date/Time	Operation	Runway	Operator	Aircraft	Type	Count
7/2/13 9:21 PM	A	29				1
7/2/13 9:41 PM	D	20				1
7/5/13 9:24 PM	D	29	Charter	Pilatus PC12	TP	1
7/6/13 9:18 PM	D	29	Individual	Cessna 206	P	1
7/8/13 5:47 AM	D	11				1
7/10/13 11:36 PM	A	11		Mooney M20K	P	1
7/11/13 5:47 AM	D	29		Cessna 182	P	1
7/11/13 9:02 PM	A	11	Corporate	Gulfstream G150	J	1
7/11/13 9:31 PM	D	29	Corporate	Gulfstream G150	J	1
7/13/13 9:18 PM	A	29	Individual	Piper Malibu	P	1
7/14/13 9:01 PM	A	11	Individual	Robinson R44	H	1
7/14/13 11:16 PM	A	29		Cessna T210	P	1
7/15/13 9:25 PM	A	29				1
7/15/13 11:01 PM	D	29		Lear 35A	J	1
7/17/13 10:04 PM	D	UNK	Individual	Cessna 310	P	1
7/18/13 9:16 PM	A	20		Unk		1
7/20/13 9:36 PM	A	11	Corporate	King Air 200	TP	1
7/20/13 9:53 PM	D	11	Corporate	Citation 525A	J	1
7/21/13 9:47 PM	A	29				1
7/23/13 9:04 PM	A	29				1
7/24/13 8:59 PM	D	11				1
7/25/13 9:14 PM	A	29				1
7/25/13 9:29 PM	D	29	Individual	Piper Malibu	P	1
7/29/13 5:58 AM	D	20				1
7/30/13 10:46 PM	D	29	Charter	Cessna 414	P	1
8/1/13 12:19 AM	A	29		Pilatus PC12	TP	1
8/1/13 8:24 PM	A	UNK				1
8/2/13 5:31 AM	D	29				1
8/2/13 8:32 PM	A	29				1
8/2/13 8:34 PM	A	11				1
8/3/13 8:36 PM	D	29	Individual	Beech Bonanza	P	1
8/3/13 8:53 PM	A	29	Corporate	Citation 525	J	1
8/3/13 9:40 PM	D	29	Individual	Beech Bonanza	P	1
8/3/13 9:54 PM	D	29	Charter	Citation 525	J	1
8/4/13 5:45 AM	D	29				1
8/4/13 8:59 PM	A	29	Individual	Cessna 210	P	1
8/4/13 9:10 PM	A	11				1
8/4/13 9:32 PM	D	29	Corporate	Cessna 340	P	1

Date/Time	Operation	Runway	Operator	Aircraft	Type	Count
8/4/13 10:48 PM	A	29				1
8/5/13 4:16 AM	A	11		Cessna 750	J	1
8/5/13 5:38 AM	D	11		Cessna 750	J	1
8/5/13 8:35 PM	D	2	Individual	Cessna 210	P	1
8/7/13 8:24 PM	D	29	Corporate	King Air 200	TP	1
8/8/13 8:30 PM	D	29	Charter	Pilatus PC12	TP	1
8/8/13 8:36 PM	A	29				1
8/8/13 9:02 PM	A	29	Individual	Mooney M20	P	1
8/8/13 9:23 PM	D	29	Corporate	Citation 550	J	1
8/9/13 8:33 PM	D	29	Corporate	King Air 200	TP	1
8/9/13 9:04 PM	A	29	Individual	Cessna 210	P	1
8/9/13 9:13 PM	A	29				1
8/10/13 10:23 PM	A	20	Individual	Pilatus PC12	TP	1
8/10/13 10:35 PM	D	29	Individual	Pilatus PC12	TP	1
8/11/13 9:03 PM	D	29	Individual	Cirrus SR20	P	1
8/13/13 8:43 PM	A	29	Individual	Beech Bonanza	P	1
8/14/13 8:49 PM	D	29				1
8/16/13 8:53 PM	A	11				1
8/16/13 9:23 PM	A	29				1
8/16/13 10:11 PM	D	29				1
8/17/13 8:55 PM	A	11				1
8/22/13 8:29 PM	A	29				1
8/23/13 9:02 PM	D	UNK	Individual	Cessna 210	P	1
8/25/13 8:25 PM	A	20	Individual	Cessna 310	P	1
8/25/13 9:09 PM	A	29	Corporate	Cessna 525	J	1
8/25/13 9:20 PM	D	29	Corporate	Cessna 525	J	1
8/25/13 11:11 PM	D	29		Gulfstream G-IV	J	1
8/27/13 5:31 AM	A	29		Cessna 525B	J	1
8/27/13 6:00 AM	D	29		Cessna 525B	J	1
8/28/13 5:33 AM	D	29		Diamond DA40	P	1
8/29/13 9:26 PM	A	11				1
8/30/13 5:03 AM	D	20		Beech V35	P	1
8/30/13 8:36 PM	A	29				1
Totals						71

DECEMBER 2013 - JANUARY 2014

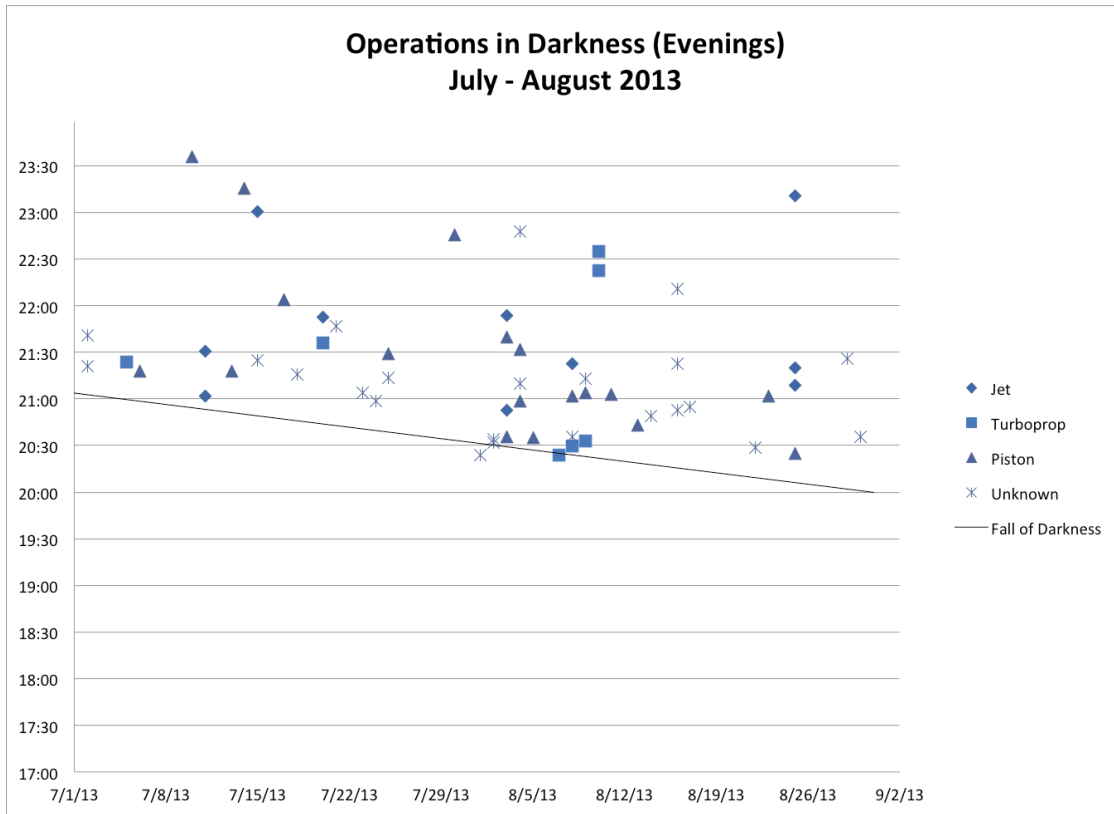
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12/1/13 5:42 PM	A	29				1
12/2/13 9:08 PM	D	29				1
12/5/13 5:23 PM	D	29	Individual	Bonanza	P	1
12/5/13 5:25 PM	D	29	Individual	Cessna 210	P	1
12/5/13 5:36 PM	A	29				1
12/5/13 6:59 PM	A	29	Individual	Cirrus SR22	P	1
12/5/13 9:19 PM	A	29				1
12/7/13 10:49 PM	D	29				1
12/8/13 5:27 PM	D	29				1
12/8/13 5:38 PM	D	29				1
12/8/13 5:59 PM	D	29	Individual	TBM700	TP	1
12/11/13 5:23 PM	A	29				1
12/11/13 6:33 PM	D	29				1
12/11/13 7:09 PM	A	29	Individual	Bonanza	P	1
12/11/13 7:20 PM	D	29	Individual	Bonanza	P	1
12/12/13 5:28 PM	A	29				1
12/12/13 6:45 PM	D	29				1
12/13/13 5:28 PM	A	29	Corporate	C25A	J	1
12/13/13 5:36 PM	A	29	Individual	Bonanza	P	1
12/13/13 5:44 PM	A	29	Individual	Cessna 210		1
12/13/13 5:51 PM	A	29				1
12/13/13 5:52 PM	A	29				1
12/13/13 5:52 PM	A	29	Individual	TBM700	TP	1
12/13/13 5:53 PM	A	29	Individual	Cirrus SR22	P	1
12/13/13 5:57 PM	A	29	Individual	Cessna 441	TP	1
12/13/13 6:52 PM	A	29				1
12/16/13 6:01 PM	A	29	Individual	Cessna 182	P	1
12/17/13 5:17 PM	A	29	Individual	Cirrus SR22	P	1
12/17/13 5:27 PM	A	29	Individual	Pilatus PC12	TP	1
12/18/13 5:15 PM	D	29	Corporate	Pilatus PC12	TP	1
12/18/13 5:26 PM	A	29				1
12/18/13 10:23 PM	A	29				1
12/18/13 10:24 PM	A	29	Corporate	Pilatus PC12	TP	1
12/19/13 5:22 PM	D	29	Individual	Pilatus PC12	TP	1
12/20/13 5:54 PM	A	29				1
12/20/13 6:38 PM	A	29				1
12/20/13 7:39 PM	A	29				1
12/21/13 5:19 PM	A	29	Individual	Cessna 421		1
12/21/13 5:27 PM	D	29	Charter	Pilatus PC12	TP	1
12/21/13 5:33 PM	A	29				1
12/21/13 5:33 PM	D	29	Corporate	Cessna 525	J	1
12/21/13 7:40 PM	A	29				1
12/22/13 5:25 PM	A	29	Individual	Bonanza		1
12/22/13 5:30 PM	D	29	Individual	Piper PA32		1
12/22/13 5:31 PM	D	29				1
12/22/13 6:11 PM	A	29				1

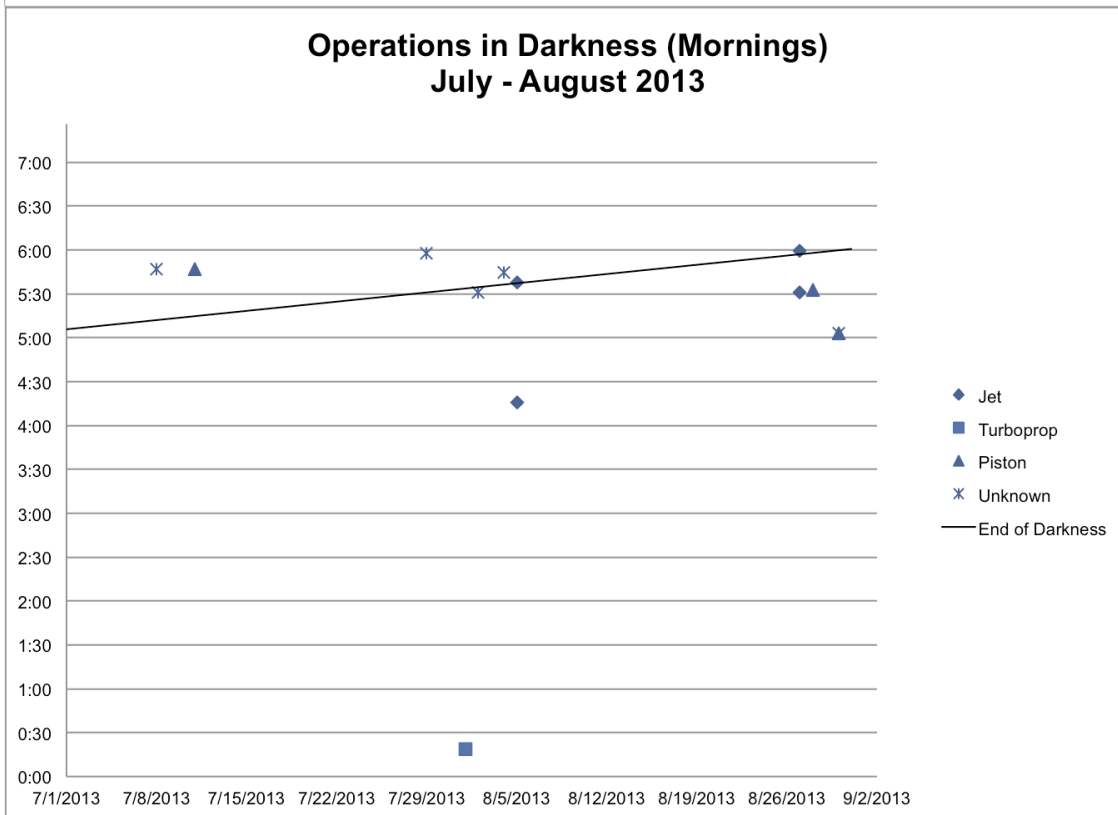
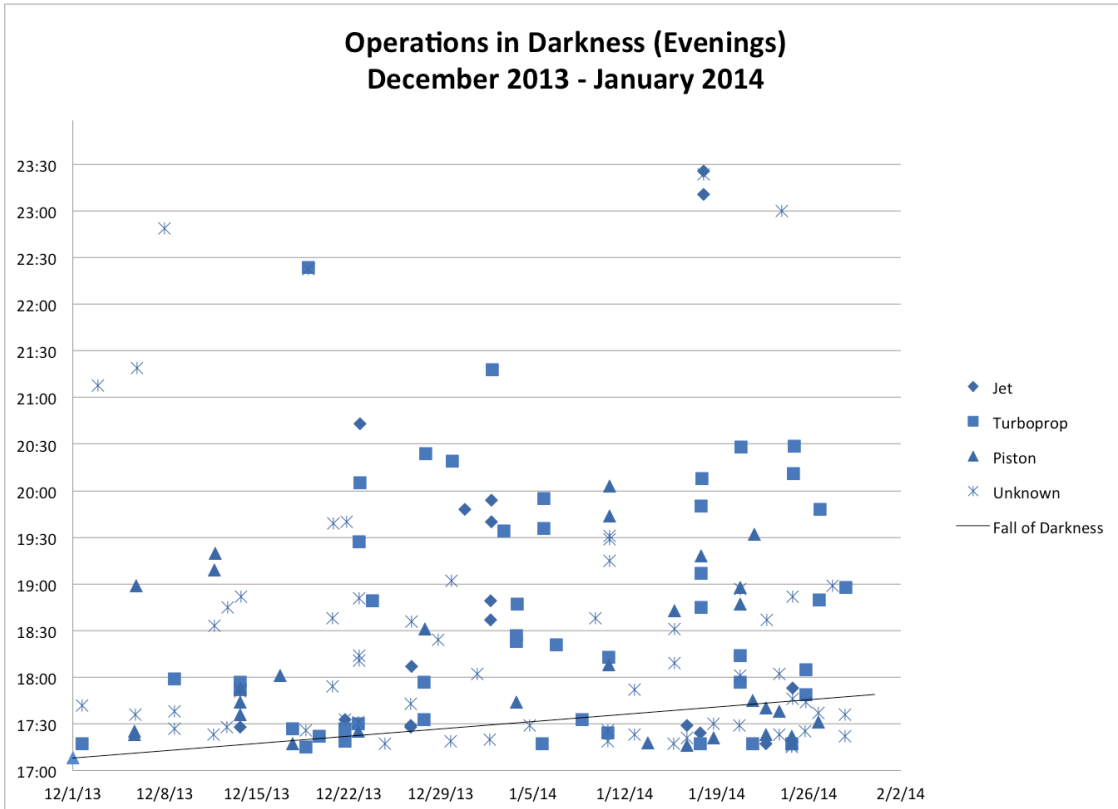
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12/22/13 6:51 PM	D	29				1
12/22/13 7:27 PM	A	29	Charter	Pilatus PC12	TP	1
12/22/13 8:05 PM	D	29	Charter	Pilatus PC12	TP	1
12/22/13 8:43 PM	D	29	Charter	C650		1
12/23/13 6:49 PM	A	29	Individual	TBM700		1
12/24/13 5:17 PM	A	29				1
12/26/13 5:28 PM	D	29	Charter	C25	J	1
12/26/13 5:29 PM	A	29	Corporate	Hawker 400	J	1
12/26/13 5:43 PM	A	29				1
12/26/13 6:07 PM	D	29	Corporate	Hawker 400	J	1
12/26/13 6:36 PM	D	29				1
12/27/13 5:33 PM	A	29	Charter	Kodiak	TP	1
12/27/13 5:57 PM	D	29	Charter	Kodiak	TP	1
12/27/13 6:31 PM	A	29	Individual	Cessna182	P	1
12/27/13 8:24 PM	A	29	Individual	TBM700	TP	1
12/28/13 6:24 PM	D	29				1
12/29/13 5:19 PM	A	29				1
12/29/13 7:02 PM	A	29				1
12/29/13 8:19 PM	A	29	Individual	Pilatus PC12	TP	1
12/30/13 6:36 AM	D	29				1
12/30/13 7:48 PM	D	29	Charter	Hawker 800	J	1
12/31/13 6:02 PM	A	29				1
1/1/14 5:20 PM	D	29				1
1/1/14 6:37 PM	A	29	Corporate	C25A	J	1
1/1/14 6:49 PM	D	29	Corporate	C25A	J	1
1/1/14 7:40 PM	A	29	Corporate	C25B	J	1
1/1/14 7:54 PM	D	29	Corporate	C25B	J	1
1/1/14 9:18 PM	A	29	Individual	Pilatus PC12	TP	1
1/2/14 7:34 PM	D	29	Charter	BE30	TP	1
1/3/14 6:47 AM	D	29				1
1/3/14 5:44 PM	A	29	Individual	Cirrus SR22	P	1
1/3/14 6:23 PM	A	29	Charter	Epic LT	TP	1
1/3/14 6:27 PM	A	29	Fractional	Pilatus PC12	TP	1
1/3/14 6:47 PM	D	29	Fractional	Pilatus PC12	TP	1
1/4/14 5:29 PM	D	29				1
1/5/14 5:17 PM	D	29	Individual	Pilatus PC12	TP	1
1/5/14 7:36 PM	A	29	Charter	Pilatus PC12	TP	1
1/5/14 7:55 PM	D	29	Charter	Pilatus PC12	TP	1
1/6/14 6:33 AM	D	29				1
1/6/14 6:21 PM	A	29	Individual	Pilatus PC12	TP	1
1/8/14 5:33 PM	A	29	Individual	Pilatus PC12	TP	1
1/8/14 5:45 PM	A	29	Individual	R44	H	1
1/9/14 6:38 PM	A	29				1
1/10/14 5:19 PM	D	29	Individual	Cessna 206		1
1/10/14 5:24 PM	A	29	Individual	Pilatus PC12	TP	1
1/10/14 5:26 PM	A	29				1
1/10/14 6:08 PM	A	29	Individual	Cirrus SR22	P	1
1/10/14 6:13 PM	A	29	Individual	Pilatus PC12	TP	1
1/10/14 7:15 PM	A	29				1
1/10/14 7:29 PM	A	29				1

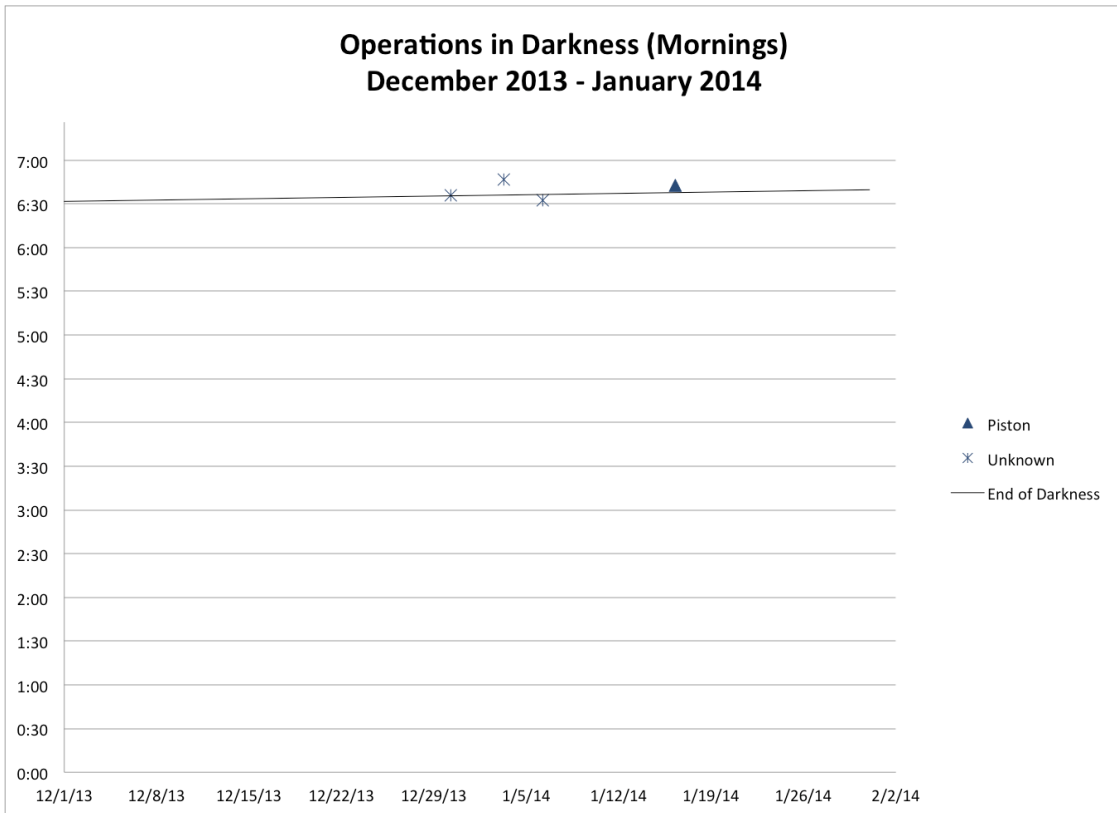
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1/10/14 7:44 PM	A	29	Corporate	Cessna 414	P	1
1/10/14 8:03 PM	D	29	Corporate	Cessna 414	P	1
1/12/14 5:23 PM	D	29				1
1/12/14 5:52 PM	D	29				1
1/13/14 5:18 PM	A	29	Individual	Lancair	P	1
1/15/14 5:17 PM	D	29				1
1/15/14 6:09 PM	A	29				1
1/15/14 6:31 PM	A	29				1
1/15/14 6:43 PM	A	29	Individual	Cirrus SR22	P	1
1/16/14 6:43 AM	D	29	Individual	Cessna 310	P	1
1/16/14 5:16 PM	A	29	Individual	Mooney	P	1
1/16/14 5:21 PM	A	29				1
1/16/14 5:29 PM	A	29	Chart8	Cessna 510	J	1
1/17/14 5:17 PM	D	29	Charter	Pilatus PC12	TP	1
1/17/14 5:24 PM	A	29	Fractional	BE40	J	1
1/17/14 6:45 PM	A	29	Charter	Pilatus PC12	TP	1
1/17/14 7:07 PM	A	29	Individual	Cessna 441	TP	1
1/17/14 7:18 PM	A	29	Individual	Cessna 310	P	1
1/17/14 7:50 PM	D	29	Individual	Cessna 441	TP	1
1/17/14 8:08 PM	A	29	Individual	Pilatus PC12	TP	1
1/17/14 11:11 PM	A	29	Charter	BE40	J	1
1/17/14 11:24 PM	D	29				1
1/17/14 11:26 PM	D	29	Charter	BE40	J	1
1/18/14 5:21 PM	A	29	Individual	Lancair	P	1
1/18/14 5:30 PM	A	29				1
1/20/14 5:29 PM	A	29				1
1/20/14 5:57 PM	A	29	Individual	Pilatus PC12	TP	1
1/20/14 6:01 PM	A	29				1
1/20/14 6:14 PM	D	29	Individual	Pilatus PC12	TP	1
1/20/14 6:47 PM	A	29	Individual	Bonanza	P	1
1/20/14 6:57 PM	D	29				1
1/20/14 6:58 PM	D	29	Individual	Bonanza	P	1
1/20/14 8:28 PM	A	29	Individual	TBM700	TP	1
1/21/14 5:17 PM	D	29	Individual	TBM700	TP	1
1/21/14 5:45 PM	A	29	Individual	Bonanza		1
1/21/14 7:32 PM	A	29	Individual	Cirrus SR22	P	1
1/22/14 5:17 PM	D	29	Fractional	CL60	J	1
1/22/14 5:23 PM	D	29	Individual	Cessna 182	P	1
1/22/14 5:40 PM	A	29	Individual	Bonanza	P	1
1/22/14 6:37 PM	A	29				1
1/23/14 5:23 PM	D	29				1
1/23/14 5:38 PM	A	29	Individual	Cessna 182	P	1
1/23/14 6:02 PM	D	29				1
1/23/14 11:00 PM	D	29				1
1/24/14 5:15 PM	A	29				1
1/24/14 5:16 PM	A	29				1
1/24/14 5:17 PM	D	29	Charter	Pilatus PC12	TP	1
1/24/14 5:18 PM	A	29	Individual	Bonanza		1
1/24/14 5:22 PM	A	29	Individual	Cessna 210	P	1
1/24/14 5:46 PM	A	29				1

Date/Time	Operation	Runway	Operator	Aircraft	Type	Count
				Cessna		
1/24/14 5:53 PM	A	29	Charter	560XL	J	1
1/24/14 6:52 PM	A	29				1
1/24/14 8:11 PM	A	29	Charter	Pilatus PC12	TP	1
1/24/14 8:29 PM	D	29	Charter	Pilatus PC12	TP	1
1/25/14 5:25 PM	D	29				1
1/25/14 5:44 PM	A	29				1
1/25/14 5:49 PM	A	29	Charter	Pilatus PC12	TP	1
1/25/14 6:05 PM	D	29	Charter	Pilatus PC12	TP	1
1/26/14 5:31 PM	A	29	Individual	Cessna 310	P	1
1/26/14 5:37 PM	D	29				1
1/26/14 6:50 PM	A	29	Charter	Pilatus PC12	TP	1
1/26/14 7:48 PM	D	29	Charter	Pilatus PC12	TP	1
1/27/14 6:59 PM	D	29				1
1/28/14 5:22 PM	D	29				1
1/28/14 5:36 PM	D	29				1
1/28/14 6:58 PM	A	29	Individual	Pilatus PC12	TP	1
Total						165

GRAPHS







APPENDIX F: TTAD BOARD OF DIRECTORS, AGENDA ITEM, CURFEW/NIGHT OPERATIONS RESTRICTIONS

Background

- Airport currently has voluntary curfew from 11PM-6AM.
- Few night operations occur at TRK due to terrain and company SOP's
- 32 calls (7%) 10PM-7AM in 2003, 12 calls on one event
- Night ops receive a +10db penalty by the State of California standards (CNEL)

OPTIONS

1. *Formal Curfew:* Airport remains open at night to some aircraft that meet certain noise criteria defined by the airport and approved by the FAA. Part 161 study required. Possible litigation following completion of study. No airport has successfully completed and implemented a Part 161 study since ANCA was passed in 1990. The Bob Hope-Burbank Airport has spent over \$2 million and the study is not yet complete. Enforcement would require punitive component.

2. *Reduced service hours:* Further reduction in AC service hours (10PM-7AM proposed) could help deter night operations. Hours align with penalty period for aircraft noise as measured by State of California. Minimal financial impact. Simple and inexpensive to implement. No FAA involvement required.

3. *Close airport at night:* Eliminates all night ops. Could violate FAA grant assurances 19 and 22 (see attachment). Airport's potential as emergency landing site for trans-Sierra flights minimized if lighting system disable after dark. Would require punitive component to enforce compliance.

4. *Ban type(s) of aircraft:* Discriminatory practice violates grant assurances unless Part 161 study completed. See #1.

5. *No change:* Continue to request voluntary curfew and monitor operations.

ANALYSIS

Based on the low volume of night operations and minimal amount of night noise calls, cost-benefits should be carefully considered. Reduction in service hours would be inexpensive and simple to implement. Options 1, 3 and 4 create financial and safety

issues. Most importantly, any alternative would have little impact on overall operations due to low volume of night activity.

APPENDIX G: 2006 ACAT PART 161 STUDY RECOMMENDATION

FAA Part 161 Study Recommendation Airport Community Advisory Team (ACAT) Truckee Tahoe Airport District April 2006

Board Action Requested: Vigorously monitor and encourage voluntary curfew while studying further need for mandatory curfew with consideration of future conditions. Collect more data. Reconsider options as needed or in 12 months.

BACKGROUND

At the Truckee Tahoe Airport District Board of Directors Workshop on February 7, 2006 there was discussion regarding the possibility of conducting a Part 161 Study to result in some form of access restrictions at the Truckee Tahoe Airport (TRK). The Board, Airport Community Advisory Team (ACAT) and staff have been briefed by special legal counsel Peter Kirsch, and noise consultants HMMH on issues surrounding both Part 150 and Part 161.

The primary purpose of these restrictions would be to limit aircraft operations impacts on the surrounding community, especially during the nighttime hours. The purpose of this paper is to summarize the current regulations that control the implementation of access restrictions and provide a description of some activities other airports have undertaken in order to facilitate discussion on this subject relevant to TRK. The Airport Noise and Capacity Act (ANCA) was enacted by Congress in 1990. ANCA is legislation that was passed by Congress to institute the gradual phase out of older “Stage 2” aircraft over 75,000 pounds in gross weight to quieter “Stage 3” aircraft by the end of the year 2000. The Act also regulated the adoption of restrictions on Stage 2 and 3 aircraft by airports. The intent was to reduce off- airport noise impacts by reducing noise generated at the source.

Prior to ANCA, FAR Part 150 required the airport to demonstrate that the proposed access restriction would first not unjustly discriminate against a single operator or type of aircraft and secondly, not create an undue burden on interstate commerce. Part 161 was created with the genesis of ANCA to allow airports a process by which to legally implement access and operations restrictions.

FAA GUIDELINES & CRITERIA

The Truckee Tahoe Airport District (TTAD) and the Airport Community Advisory Team (ACAT) have been investigating the applicability of a Part 161 study to the current and future situation at Truckee Tahoe Airport (TRK). The Part 161 process is used to adopt or implement a noise or use restriction at an airport.

The FAA recommends an incremental approach to noise control at airports. The Part 161 study and restrictions are seen as measures of last resort. The FAA requires that the Part 161 study demonstrate that any restrictive measure achieves noise reduction benefits (areas inside the 65db CNEL contour) not met by other non-restrictive measures. It also requires identification and evaluation of alternative restrictive options to meet the stated goal. Data to support the options is required.

After ANCA was passed, FAR Part 161 added more restrictive criteria. In addition to unjust discrimination and burdens on interstate commerce, an airport must now demonstrate the restriction complies with the following:

1. Provides an adequate analysis of the costs and benefits of the proposed restriction and alternative measures.
2. The restriction is reasonable, non arbitrary and non-discriminatory.
3. The restriction maintains safe and efficient use of navigable airspace.
4. The restriction does not conflict with any existing federal statute or regulation.
5. The applicant has provided adequate opportunity for public comment on the proposed restriction.
6. The restriction does not create an undue burden on the National Aviation System.
7. The study must also account for the noise impact on the receiving communities if the restricted flights are presumed to be diverted.

OTHER AIRPORTS

While each community and airport is unique, it is important for TTAD to be conscious of the experiences of other airports. With the exception of the Naples airport, the following airports began studies and never submitted them to the FAA for various reasons:

1. **Kahului Airport, Kahulu i, Maui, Hawaii**

The state of Hawaii was exempted from some ANCA provisions due to the significant role of air transportation in the economy. Stage 2 aircraft operating inter-island flights were exempted and capped, thus allowing commercial operations past the year 2000. Kahului Airport, owned and operated by the State of Hawaii, unsuccessfully pursued a ban on night commercial Stage 2 aircraft operations.

The FAA stated in preliminary correspondence, “A local phase out requirement would also frustrate the national aviation noise policy because action by the State of Hawaii to impose a local phase out at Kahului would prompt similar or more stringent restrictions on operations by Stage 2 aircraft at its other airports. A patchwork of airport use restrictions is the kind of situation that Congress sought to avoid by adopting the Act...” The FAA clearly did not want to allow local restrictions based on aircraft stage and time of operation.

2. **Minneapolis-St. Paul International Airport, Minneapolis, Minnesota**

The Metropolitan Airports Commission (MAC) prepared a Part 161 notice and analysis in July 2000 to adopt revisions to current MAC Ordinance 51 to implement a nighttime curfew on Stage 2 jet operations and a nighttime curfew on maintenance run-ups at Flying Cloud Airport (FCM – located in the City of Eden Prairie). MAC was also proposing to revise Ordinance 51 to prohibit scheduled airline and Part 121 cargo operations at FCM.

The FAA commented to the MAC that the mandatory restrictions outlined in the Part 161 notice and analysis were discriminatory and therefore inconsistent with the conditions of receiving federal grants. As a result, the MAC discontinued the Part 161 process to implement the mandatory restrictions and instead replaced Ordinance 51 with Ordinance 97. The new ordinance prohibits maintenance run-ups between the hours of 10 p.m. and 7 a.m. and restricts the use of the airport to only aircraft weighing less than 60,000 pounds certified max gross takeoff weight, dual wheel (runway weight bearing capacity). The new 60,000 pound restriction was a relaxation of the existing 20,000 pound restriction in Ordinance 51 and therefore was acceptable to the FAA.

3. **San Francisco International, San Francisco, CA**

As a precursor to the San Francisco International Airport (SFO) Part 161 Study, HMMH developed a FAR Part 161.205 (Stage 2 restriction) work scope for the City and County of San Francisco for a proposed expansion of the nighttime curfew on Stage 2 operations at SFO. Specifically, the proposed airport use restriction evaluated under FAR Part 161 was a restriction, beginning on January 1, 1999 of landing and takeoff operations by Stage 2 aircraft greater than 75,000 pounds between the hours of 20:00 to 08:00.

The study evaluated noise effects and cost benefits of Stage 2 restrictions for two alternative periods: (1) 21:00 to 08:00 and (2) 22:00 to 08:00. Each of the potential restrictions was an extension of an existing restriction at SFO. At the time, San Francisco International Airport Noise Abatement Regulations, Resolution No. 88-016 as amended through January 17, 1995 by Resolution No. 95-0015, which were grandfathered under the Aircraft Noise and Capacity Act, restricted operations of Stage 2 aircraft greater than 75,000 pounds from operating between 23:00 and 07:00.

During the Part 161 study, HMMH carefully examined the impact of the restrictions on nighttime all-cargo aircraft operations. The study concluded that the benefit (in terms of noise reduction) of implementing the restriction outweighed the cost to the airlines. The SFO FAR Part 161 Study was the first Part 161 study submitted to the Federal Aviation Administration for review. SFO elected to withdraw the study when the airlines agreed to implement voluntary noise reduction measures that accomplished the same goals as the Part 161 study.

4. **San Jose International, San Jose, CA**

The City of San Jose hired HMMH to prepare a Part 161 work scope that met all of the requirements of FAR Part 161 while accounting for requirements generated by agreements with Citizens Against Airport Pollution (CAAP) and the on-going airport Master Plan Update. The Part 161 was contemplated to enact Stage 2 aircraft noise restrictions.

As a follow on to the San José International Airport (SJC) Part 161 Work Scope Development project, the City of San Jose hired HMMH to conduct a Part 161 Study. HMMH examined the noise effects and benefits- costs associated with two potential Stage 2 restrictions: 1) a complete ban on Stage 2 aircraft operations and 2) a collapsing curfew; during which Stage 2 aircraft would have fewer and fewer hours to operate at SJC as the Year 2000 approached. The study was completed

within the 12-month schedule dictated by the stipulated agreement between the City of San José and Citizens Against Airport Pollution (CAAP).

The SJC Part 161 Study revealed several important facts: while some passenger carriers would experience economic losses due to the restrictions, others would experience economic gains from substituting more efficient Stage 3 aircraft for a Stage 2 aircraft; one cargo carrier would leave SJC completely and resume operations at the next closest air carrier airport; lost secondary spending (hotel rooms, meals, etc.) within the City of San José, due to passengers shifting to other Bay-area airports, was significant; and, most important, there was not enough time between the date of implementation of the Stage 2 restrictions and the Year 2000 for the economic benefits (i.e., reduced sound insulation costs) to overcome the costs of the restrictions.

The SJC Part 161 Study was the first full Part 161 study undertaken under the Aircraft Noise and Capacity Act and remains the model upon which all Part 161 studies to date have been based.

5. Bob Hope/ Glendale, Pasadena, Burbank Airport

Burbank, CA (BUR) began a Part 161 study on July 15, 2000 with the goal, "To eliminate or significantly reduce nighttime flight noise at Burbank Airport now and in the future." The study ceased in late 2003 after preliminary review from the FAA indicating a complete nighttime curfew was inconsistent with Part 161 criteria.

Specific Wording: The Burbank-Glendale-Pasadena Airport Authority will enact a curfew on all operations by aircraft at BUR between the hours of 10 p.m. and 7 a.m. (local time). The curfew will take effect sixty days following approval. This proposed restriction would be subject to approval by the Federal Aviation Administration under the provisions of Federal Aviation Regulation Part 161.

Exceptions: The following aircraft shall be permitted to land at and takeoff from the Burbank-Glendale-Pasadena Airport between the hours of 10:00 p.m. and 7:00 a.m.:

1. Law enforcement and fire fighting aircraft, military aircraft, aircraft owned or operated by the armed forces of the United States, and aircraft operated in support of military operations.
2. Medical flight aircraft with documentation engaged in active emergency operations for the transportation of patients or human organs.
3. Aircraft delayed in landing and/or takeoff by weather, mechanical, or air traffic control; provided however, that this exception shall not authorize any landing or takeoff between the hours of 11:00 p.m. and 7:00 a.m.

Upon the request of the Airport Authority, the aircraft operator or pilot in command shall document or demonstrate the precise emergency or delay causing conditions resulting in a landing and/or takeoff between the hours of 10:00 p.m. and 7:00 a.m.

Enforcement: Violators penalized by a series of fines and/or sanctions:

(Violations are based on a 12 month period):

1st Violation - \$1000 Fine

2nd Violation - \$2000 Fine

3rd Violation - \$3000 Fine

4th Violation - \$5000 Fine and action to ban access or terminate lease

After nearly 4 years and \$3 million the airport ceased the study of a nighttime curfew for all operations. The Part 161 study was never formally submitted to the FAA.

The success and failures of other airports certainly don't predict the outcome of a Part 161 by TTAD, however they do provide insight into the FAA process. The Burbank story is interesting because the curfew was "non-discriminatory" (no one was allowed to fly).

6. **Naples, FL -Stage 2 GA Jet Restriction**

Naples is the only airport to successfully implement a restriction with the Part 161 process (and much litigation) since ANCA was established. The Naples study is the only submission that the FAA has found in compliance with Part 161 analysis, documentation, and notification requirements. The airport banned all Stage 2 aircraft in November of 2000. It is important to note that no airport has ever attempted to ban Stage 3 aircraft specifically. Naples used a 60db DNL standard in the assessment of community impact. The standard was previously established by the City and County . Naples spent over \$3 million and nearly 4 years conducting the study and litigating.

Burbank and Naples both provide examples of the Part 161 process and its various risks and opportunities. While no two airports are the same, it is important to carefully consider local conditions in the decision to pursue a Part 161 Study.

TRUCKEE TAHOE AIRPORT CONDITIONS AND FACTS

An assessment of local conditions and facts is important to gauge the impacts of current operations and fleet mix. As actions are considered the decisions must be considered in the interest of future operational scenarios at TRK. The success or failure of very light jets, fuel pricing, avionics advances, and other innovations may or may not have a measurable impact on the community, but possible outcomes must be considered.

The current fleet mix and operational count at TRK is assessed by the UNICOM operator manually in putting each operation into a database. While not all operations are captured, the data is worthwhile for reference purposes. Likewise, staff also records all reports of community annoyance related to aircraft operations in a separate database. The two key indicators from this data are 1) an increase in jet operations, and 2) minimal reported nighttime annoyance. Nighttime is currently defined as 11:00 p.m.-6:00 a.m. based on the voluntary curfew at TRK. It should be noted that the State of California defines nighttime as 10:00 p.m.-7:00 a.m. for purposes of noise modeling.

The key question is "What do we want to accomplish and is a Part 161 Study a tool to consider?" The following facts must be considered:

1. No Part 150 Study has been completed by TTAD. Although a Part 150 study is not a requirement, no airport has ever attempted the Part 161 process without a 150 study.
2. No homes are currently located within the 65db CNEL contour on the average annual day.

3. TTAD estimates night operations (11:00 p.m.- 6:00 a.m.) to be less than 50 per year. No formal data exists making baseline impacts difficult to determine.
4. Total reported nighttime annoyance is very low and has decreased over the last three years.
5. If a restriction were adopted and implemented, TRK does not currently have the ability to monitor and enforce the requirements.
6. Non-restrictive options have not been thoroughly explored and implemented.

While current conditions don't provide evidence to support a successful Part 161 study, the future conditions of the airport and the community must be considered. Important factors to consider are:

- Population growth in Truckee and the Martis Valley
- Increase in total airport operations
- Change of aircraft fleet mix
- Introduction of very light jets
- Avionics advancements, enabling more operations at night or in inclement weather
- Introduction of next generation air taxi services

No airport has attempted a Part 161 study to prevent conditions that may occur in the future. Special counsel to TTAD has stated, "This would be an interesting approach..." If TRK were to attempt a Part 161 Study this would be the likely approach given current conditions. The opportunities in this approach would be mostly strategic, yet not without risk. Conducting a Part 161 study in a preemptive approach could provide some value in discussions with various stakeholders, but the unknown outcome could weaken its strategic value.

The total cost for a Part 161 study could range from \$250,000-\$1,000,000 with additional legal costs. While difficult to estimate legal costs, the City of Naples spent nearly \$4,000,000 defending the airport in the Part 161 process against the FAA and private parties. Litigation from private parties, AOPA, NBAA and the FAA could follow a Part 161 study at TRK based on briefings from outside legal counsel, Peter Kirsch.

OPTIONS FOR ACTION

1. Do nothing, wait and see.
2. Vigorously monitor and encourage voluntary curfew while studying further need for mandatory curfew with consideration of future conditions. Therefore a Part 161 study is not recommended at this time. Collect more data. Reconsider options as needed or in 12 months.
3. Conduct Part 161 study, adopt, but don't implement.
4. Conduct Part 161 study, adopt and implement (requires operations monitoring system and police powers for enforcement).

CONCLUSION & RECOMMENDATION

The decision to initiate a Part 161 study should incorporate the likelihood of acceptance by the FAA, overall cost (study and potential litigation), ability to implement and monitor. Finally overall strategic value should be considered.

Based on the current conditions at TRK coupled with the track record of other airports, the likelihood of getting the study approved by the FAA is very small. The ACAT believes that many of the current problems at TRK can be mitigated and/or solved through voluntary means and other programs currently being developed. While the study could provide some strategic value to the airport in discussions with other stakeholders, the large cost of this potential benefit is not supported by the ACAT at this time.

The ACAT does not recommend beginning a Part 161 study for the Truckee Tahoe Airport. The ACAT has not recommended any specific actions that would require a Part 161 study, therefore a Part 161 study is not recommended at this time. The ACAT recommends vigorous monitoring and encouragement of the existing voluntary curfew while studying further need for mandatory curfew with consideration of future conditions. The ACAT further recommends that more data be collected and the options for action be reconsidered as needed or in 12 months.

**APPENDIX H: UNITED STATES NAVAL OBSERVATORY ASTRONOMICAL TABLES,
 TRUCKEE, CALIFORNIA (2014)**

Available at http://aa.usno.navy.mil/data/docs/RS_OneYear.

Add one hour for daylight time, if and when in use.

SUNRISE AND SUNSET

Location: $\overset{\circ}{W}120^{\circ}12'$, $\overset{\circ}{N}39^{\circ}20'$

TRUCKEE, CALIFORNIA
 Rise and Set for the Sun for 2014
 Pacific Standard Time

Astronomical Applications Dept.
 U. S. Naval Observatory
 Washington, DC 20392-5420

Day	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
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02	0721	1649	0707	1723	0632	1754	0544	1826	0501	1855	0436	1922	0438	1931	0502	1912	0530	1830	0558	1742	0630	1658	0703	1638
03	0721	1650	0706	1724	0630	1755	0542	1827	0500	1856	0435	1923	0439	1931	0503	1911	0531	1828	0559	1740	0631	1657	0704	1638
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05	0721	1652	0704	1726	0627	1758	0539	1829	0457	1858	0435	1924	0440	1931	0505	1908	0533	1825	0601	1737	0633	1655	0705	1637
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07	0721	1654	0702	1729	0624	1800	0536	1831	0455	1900	0434	1925	0441	1930	0506	1906	0535	1822	0603	1734	0636	1653	0707	1637
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10	0720	1657	0658	1732	0620	1803	0531	1834	0452	1903	0434	1927	0443	1929	0509	1902	0538	1817	0606	1729	0639	1650	0710	1637
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31	0709	1720			0547	1824			0436	1921			0500	1914	0528	1833			0628	1701			0721	1647

CIVIL TWILIGHT

Location: W120 12, N39 20

TRUCKEE, CALIFORNIA
 Civil Twilight for 2014
 Pacific Standard Time

Astronomical Applications Dept.
 U. S. Naval Observatory
 Washington, DC 20392-5420

Day	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
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13	0650	1729	0627	1803	0548	1833	0459	1904	0419	1936	0401	2001	0414	1959	0443	1927	0513	1839	0542	1752	0614	1716	0642	1708
14	0650	1730	0626	1804	0547	1834	0457	1905	0418	1937	0401	2001	0414	1959	0444	1926	0514	1838	0543	1750	0615	1715	0643	1708
15	0650	1731	0625	1805	0545	1835	0456	1906	0417	1938	0401	2002	0415	1958	0445	1925	0515	1836	0544	1749	0616	1715	0643	1709
16	0649	1732	0624	1806	0544	1836	0454	1907	0416	1939	0401	2002	0416	1957	0446	1923	0516	1834	0545	1747	0617	1714	0644	1709
17	0649	1733	0623	1807	0542	1837	0453	1908	0415	1940	0401	2002	0417	1957	0447	1922	0517	1833	0546	1746	0618	1713	0645	1709
18	0648	1735	0621	1809	0541	1838	0451	1910	0414	1941	0401	2003	0418	1956	0448	1920	0518	1831	0547	1745	0619	1713	0645	1710
19	0648	1736	0620	1810	0539	1839	0450	1911	0413	1942	0402	2003	0419	1955	0449	1919	0519	1829	0548	1743	0620	1712	0646	1710
20	0648	1737	0619	1811	0537	1840	0448	1912	0412	1943	0402	2003	0420	1954	0450	1917	0520	1828	0549	1742	0621	1712	0646	1711
21	0647	1738	0618	1812	0536	1841	0447	1913	0411	1944	0402	2003	0420	1953	0451	1916	0521	1826	0550	1741	0622	1711	0647	1711
22	0647	1739	0616	1813	0534	1842	0446	1914	0411	1945	0402	2004	0421	1953	0452	1914	0522	1824	0551	1739	0623	1711	0647	1712
23	0646	1740	0615	1814	0533	1843	0444	1915	0410	1946	0402	2004	0422	1952	0453	1913	0523	1823	0552	1738	0624	1710	0648	1712
24	0645	1741	0614	1815	0531	1844	0443	1916	0409	1947	0403	2004	0423	1951	0454	1911	0524	1821	0553	1737	0625	1710	0648	1713
25	0645	1742	0612	1816	0529	1845	0441	1917	0408	1948	0403	2004	0424	1950	0455	1910	0525	1820	0554	1735	0626	1709	0649	1713
26	0644	1743	0611	1817	0528	1846	0440	1918	0408	1948	0403	2004	0425	1949	0456	1908	0526	1818	0555	1734	0627	1709	0649	1714
27	0643	1744	0609	1818	0526	1847	0438	1919	0407	1949	0404	2004	0426	1948	0457	1907	0526	1816	0556	1733	0628	1709	0649	1715
28	0643	1745	0608	1819	0524	1848	0437	1920	0406	1950	0404	2004	0427	1947	0458	1905	0527	1815	0557	1732	0629	1708	0650	1715
29	0642	1746			0523	1849	0436	1921	0406	1951	0405	2004	0428	1946	0459	1904	0528	1813	0558	1731	0630	1708	0650	1716
30	0641	1748			0521	1850	0434	1922	0405	1952	0405	2004	0429	1945	0500	1902	0529	1811	0559	1729	0631	1708	0650	1717
31	0640	1749			0520	1851			0405	1953			0430	1944	0501	1900		0600	1728			0650	1717	

APPENDIX I: FEDERAL AVIATION REGULATIONS § 61.57 (RECENT FLIGHT EXPERIENCE: PILOT IN COMMAND)

(A) GENERAL EXPERIENCE.

(1) Except as provided in paragraph (e) of this section, no person may act as a pilot in command of an aircraft carrying passengers or of an aircraft certificated for more than one pilot flight crewmember unless that person has made at least three takeoffs and three landings within the preceding 90 days, and--

- (i) The person acted as the sole manipulator of the flight controls; and
- (ii) The required takeoffs and landings were performed in an aircraft of the same category, class, and type (if a type rating is required), and, if the aircraft to be flown is an airplane with a tailwheel, the takeoffs and landings must have been made to a full stop in an airplane with a tailwheel.

(2) For the purpose of meeting the requirements of paragraph (a)(1) of this section, a person may act as a pilot in command of an aircraft under day VFR or day IFR, provided no persons or property are carried on board the aircraft, other than those necessary for the conduct of the flight.

(3) The takeoffs and landings required by paragraph (a)(1) of this section may be accomplished in a flight simulator or flight training device that is--

- (i) Approved by the Administrator for landings; and
- (ii) Used in accordance with an approved course conducted by a training center certificated under part 142 of this chapter.

(B) NIGHT TAKEOFF AND LANDING EXPERIENCE.

(1) Except as provided in paragraph (e) of this section, no person may act as pilot in command of an aircraft carrying passengers during the period beginning 1 hour after sunset and ending 1 hour before sunrise, unless within the preceding 90 days that person has made at least three takeoffs and three landings to a full stop during the period beginning 1 hour after sunset and ending 1 hour before sunrise, and-

- (i) That person acted as sole manipulator of the flight controls; and

(ii) The required takeoffs and landings were performed in an aircraft of the same category, class, and type (if a type rating is required).

(2) The takeoffs and landings required by paragraph (b)(1) of this section may be accomplished in a flight simulator that is--

(i) Approved by the Administrator for takeoffs and landings, if the visual system is adjusted to represent the period described in paragraph (b)(1) of this section; and

(ii) Used in accordance with an approved course conducted by a training center certificated under part 142 of this chapter.

(C) INSTRUMENT EXPERIENCE.

Except as provided in paragraph (e) of this section, a person may act as pilot in command under IFR or weather conditions less than the minimums prescribed for VFR only if:

(1) Use of an airplane, powered-lift, helicopter, or airship for maintaining instrument experience. Within the 6 calendar months preceding the month of the flight, that person performed and logged at least the following tasks and iterations in an airplane, powered-lift, helicopter, or airship, as appropriate, for the instrument rating privileges to be maintained in actual weather conditions, or under simulated conditions using a view-limiting device that involves having performed the following--

(i) Six instrument approaches.

(ii) Holding procedures and tasks.

(iii) Intercepting and tracking courses through the use of navigational electronic systems.

(2) Use of a flight simulator or flight training device for maintaining instrument experience. Within the 6 calendar months preceding the month of the flight, that person performed and logged at least the following tasks and iterations in a flight simulator or flight training device, provided the flight simulator or flight training device represents the category of aircraft for the instrument rating privileges to be maintained and involves having performed the following--

(i) Six instrument approaches.

(ii) Holding procedures and tasks.

(iii) Intercepting and tracking courses through the use of navigational electronic systems.

(3) Use of an aviation training device for maintaining instrument experience. Within the 2 calendar months preceding the month of the flight, that person performed and logged at least the following tasks, iterations, and time in an aviation training device and has performed the following--

(i) Three hours of instrument experience.

(ii) Holding procedures and tasks.

(iii) Six instrument approaches.

(iv) Two unusual attitude recoveries while in a descending, Vne airspeed condition and two unusual attitude recoveries while in an ascending, stall speed condition.

(v) Interception and tracking courses through the use of navigational electronic systems.

(4) Combination of completing instrument experience in an aircraft and a flight simulator, flight training device, and aviation training device. A person who elects to complete the instrument experience with a combination of an aircraft, flight simulator or flight training device, and aviation training device must have performed and logged the following within the 6 calendar months preceding the month of the flight--

(i) Instrument experience in an airplane, powered-lift, helicopter, or airship, as appropriate, for the instrument rating privileges to be maintained, performed in actual weather conditions, or under simulated weather conditions while using a view-limiting device, on the following instrument currency tasks:

(A) Instrument approaches.

(B) Holding procedures and tasks.

(C) Interception and tracking courses through the use of navigational electronic systems.

(ii) Instrument experience in a flight simulator or flight training device

that represents the category of aircraft for the instrument rating privileges to be maintained and involves performing at least the following tasks--

- (A) Instrument approaches.
- (B) Holding procedures and tasks.
- (C) Interception and tracking courses through the use of navigational electronic systems.

(iii) Instrument experience in an aviation training device that represents the category of aircraft for the instrument rating privileges to be maintained and involves performing at least the following tasks--

- (A) Six instrument approaches.
- (B) Holding procedures and tasks.
- (C) Interception and tracking courses through the use of navigational electronic systems.

(5) Combination of completing instrument experience in a flight simulator or flight training device, and an aviation training device. A person who elects to complete the instrument experience with a combination of a flight simulator, flight training device, and aviation training device must have performed the following within the 6 calendar months preceding the month of the flight--

(i) Instrument recency experience in a flight simulator or flight training device that represents the category of aircraft for the instrument rating privileges to be maintained and involves having performed the following tasks:

- (A) Six instrument approaches.
- (B) Holding procedures and tasks.
- (C) Interception and tracking courses through the use of navigational electronic systems.

(ii) Three hours of instrument experience in an aviation training device that represents the category of aircraft for the instrument rating privileges to be maintained and involves performing at least the following tasks--

- (A) Six instrument approaches.
 - (B) Holding procedures and tasks.
 - (C) Interception and tracking courses through the use of navigational electronic systems.
 - (D) Two unusual attitude recoveries while in a descending, Vne airspeed condition and two unusual attitude recoveries while in an ascending, stall speed condition.
- (6) Maintaining instrument recent experience in a glider.
- (i) Within the 6 calendar months preceding the month of the flight, that person must have performed and logged at least the following instrument currency tasks, iterations, and flight time, and the instrument currency must have been performed in actual weather conditions or under simulated weather conditions--
 - (A) One hour of instrument flight time in a glider or in a single engine airplane using a view-limiting device while performing interception and tracking courses through the use of navigation electronic systems.
 - (B) Two hours of instrument flight time in a glider or a single engine airplane with the use of a view-limiting device while performing straight glides, turns to specific headings, steep turns, flight at various airspeeds, navigation, and slow flight and stalls.
 - (ii) Before a pilot is allowed to carry a passenger in a glider under IFR or in weather conditions less than the minimums prescribed for VFR, that pilot must--
 - (A) Have logged and performed 2 hours of instrument flight time in a glider within the 6 calendar months preceding the month of the flight.
 - (B) Use a view-limiting-device while practicing performance maneuvers, performance airspeeds, navigation, slow flight, and stalls.

(D) INSTRUMENT PROFICIENCY CHECK.

Except as provided in paragraph (e) of this section, a person who has failed to meet the instrument experience requirements of paragraph (c) for more than six calendar months may reestablish instrument currency only by completing an instrument proficiency check. The instrument proficiency check must consist of the areas of operation and instrument tasks required in the instrument rating practical test standards.

(1) The instrument proficiency check must be--

- (i) In an aircraft that is appropriate to the aircraft category;
- (ii) For other than a glider, in a flight simulator or flight training device that is representative of the aircraft category; or
- (iii) For a glider, in a single-engine airplane or a glider.

(2) The instrument proficiency check must be given by--

- (i) An examiner;
- (ii) A person authorized by the U.S. Armed Forces to conduct instrument flight tests, provided the person being tested is a member of the U.S. Armed Forces;
- (iii) A company check pilot who is authorized to conduct instrument flight tests under part 121, 125, or 135 of this chapter or subpart K of part 91 of this chapter, and provided that both the check pilot and the pilot being tested are employees of that operator or fractional ownership program manager, as applicable;
- (iv) An authorized instructor; or
- (v) A person approved by the Administrator to conduct instrument practical tests.

(E) EXCEPTIONS.

(1) Paragraphs (a) and (b) of this section do not apply to a pilot in command who is employed by a part 119 certificate holder authorized to conduct operations under part 125 when the pilot is engaged in a flight operation for that certificate holder if the pilot in command is in compliance with §§ 125.281 and 125.285 of this chapter.

(2) This section does not apply to a pilot in command who is employed by a part 119 certificate holder authorized to conduct operations under part 121 when the pilot is engaged in a flight operation under parts 91 and 121 for that certificate holder if the pilot in command is in compliance with §§ 121.435 or 121.436, as applicable, and § 121.439 of this chapter.

(3) This section does not apply to a pilot in command who is employed by a part 119 certificate holder authorized to conduct operations under part 135 when the pilot is engaged in a flight operation under parts 91 and 135 for that certificate holder if the pilot in command is in compliance with §§ 135.243 and 135.247 of this chapter.

(4) Paragraph (b) of this section does not apply to a pilot in command of a turbine-powered airplane that is type certificated for more than one pilot crewmember, provided that pilot has complied with the requirements of paragraph (e)(4)(i) or (ii) of this section:

(i) The pilot in command must hold at least a commercial pilot certificate with the appropriate category, class, and type rating for each airplane that is type certificated for more than one pilot crewmember that the pilot seeks to operate under this alternative, and:

(A) That pilot must have logged at least 1,500 hours of aeronautical experience as a pilot;

(B) In each airplane that is type certificated for more than one pilot crewmember that the pilot seeks to operate under this alternative, that pilot must have accomplished and logged the daytime takeoff and landing recent flight experience of paragraph (a) of this section, as the sole manipulator of the flight controls;

(C) Within the preceding 90 days prior to the operation of that airplane that is type certificated for more than one pilot crewmember, the pilot must have accomplished and logged at least 15 hours of flight time in the type of airplane that the pilot seeks to operate under this alternative; and

(D) That pilot has accomplished and logged at least 3 takeoffs and 3 landings to a full stop, as the sole manipulator of the flight controls, in a turbine-powered airplane that requires more than one pilot crewmember. The pilot must have performed the takeoffs and landings during the period beginning 1 hour after sunset and ending 1 hour before sunrise within the preceding 6 months prior to the month of the flight.

(ii) The pilot in command must hold at least a commercial pilot certificate with the appropriate category, class, and type rating for each airplane that is type certificated for more than one pilot crewmember that the pilot seeks to operate under this alternative, and:

(A) That pilot must have logged at least 1,500 hours of aeronautical experience as a pilot;

(B) In each airplane that is type certificated for more than one pilot crewmember that the pilot seeks to operate under this alternative, that pilot must have accomplished and logged the daytime takeoff and landing recent flight experience of paragraph (a) of this section, as the sole manipulator of the flight controls;

(C) Within the preceding 90 days prior to the operation of that airplane that is type certificated for more than one pilot crewmember, the pilot must have accomplished and logged at least 15 hours of flight time in the type of airplane that the pilot seeks to operate under this alternative; and

(D) Within the preceding 12 months prior to the month of the flight, the pilot must have completed a training program that is approved under part 142 of this chapter. The approved training program must have required and the pilot must have performed, at least 6 takeoffs and 6 landings to a full stop as the sole manipulator of the controls in a flight simulator that is representative of a turbine-powered airplane that requires more than one pilot crewmember. The flight simulator's visual system must have been adjusted to represent the period beginning 1 hour after sunset and ending 1 hour before sunrise.

(F) NIGHT VISION GOGGLE OPERATING EXPERIENCE.

(1) A person may act as pilot in command in a night vision goggle operation with passengers on board only if, within 2 calendar months preceding the month of the flight, that person performs and logs the following tasks as the sole manipulator of the controls on a flight during a night vision goggle operation--

(i) Three takeoffs and three landings, with each takeoff and landing including a climbout, cruise, descent, and approach phase of flight (only required if the pilot wants to use night vision goggles during the takeoff and landing phases of the flight).

(ii) Three hovering tasks (only required if the pilot wants to use night vision goggles when operating helicopters or powered-lifts during the hovering phase of flight).

(iii) Three area departure and area arrival tasks.

(iv) Three tasks of transitioning from aided night flight (aided night flight means that the pilot uses night vision goggles to maintain visual surface reference) to unaided night flight (unaided night flight means that the pilot does not use night vision goggles) and back to aided night flight.

(v) Three night vision goggle operations, or when operating helicopters or powered-lifts, six night vision goggle operations.

(2) A person may act as pilot in command using night vision goggles only if, within the 4 calendar months preceding the month of the flight, that person performs and logs the tasks listed in paragraph (f)(1)(i) through (v) of this section as the sole manipulator of the controls during a night vision goggle operation.

(G) NIGHT VISION GOGGLE PROFICIENCY CHECK.

A person must either meet the night vision goggle experience requirements of paragraphs (f)(1) or (f)(2) of this section or pass a night vision goggle proficiency check to act as pilot in command using night vision goggles. The proficiency check must be performed in the category of aircraft that is appropriate to the night vision goggle operation for which the person is seeking the night vision goggle privilege or in a flight simulator or flight training device that is representative of that category of aircraft. The check must consist of the tasks listed in Sec. 61.31(k), and the check must be performed by:

(1) An Examiner who is qualified to perform night vision goggle operations in that same aircraft category and class;

(2) A person who is authorized by the U.S. Armed Forces to perform night vision goggle proficiency checks, provided the person being administered the check is also a member of the U.S. Armed Forces;

(3) A company check pilot who is authorized to perform night vision goggle proficiency checks under parts 121, 125, or 135 of this chapter, provided that both the check pilot and the pilot being tested are employees of that operator;

(4) An authorized flight instructor who is qualified to perform night vision goggle operations in that same aircraft category and class;

- (5) A person who is qualified as pilot in command for night vision goggle operations in accordance with paragraph (f) of this section; or
- (6) A person approved by the FAA to perform night vision goggle proficiency checks.

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