

TRUCKEE TAHOE AIRPORT DISTRICT
BOARD OF DIRECTORS AGENDA ITEM SUMMARY

Topic: Hangar 3 – Multiuse Hangar Project Assessment Review.
Consideration of Funding Project Design and Bidding.

Purpose	Information:	Guidance:	Decision: X
Recommendation	<p>Consider Hangar 3 Needs Assessment as presented by C&S Companies. Consider releasing funding for design and bidding of Hangar 3 project as included in the FY2014 Budget.</p> <p>After reviewing the data, it is Staff's recommendation to move forward with design and bidding on the project. If the Board requires additional analysis or data to make a decision, staff is not opposed to considering this item at the April 23, 2014 meeting allowing more time for review.</p>		
Last Action	<p>The Board of Directors along with Staff last discussed this topic at the Board/Staff Retreat on January 29, 2014. There was consensus to finalize the Needs Assessment and review it in detail at an upcoming Board Meeting, along with discussion and potential action on the release of the design and bidding funds. The General Manager informed the Board that the Needs Assessment will be presented to the Board and Public at the March 26, 2014 Board Meeting.</p>		
Discussion	<p>The concept of a multiuse hangar with the primary purpose of sheltering business jets along with multiple community event and nonprofit use has been discussed for some time. It was discussed and reviewed as part of the Master Plan Outreach Meetings and in the recent Godbe Survey. The Godbe Survey posed the question: <i>"The Truckee Tahoe Airport is considering constructing a large multiuse hangar. The hangar will primarily be used to park and de-ice private aircraft and business jets for a fee. The hangar will also be available for community use, public events, nonprofit fundraisers, as well as emergency services. Do you support or oppose this proposal?"</i> 76% responded in favor of the proposal, 13% were opposed, 11% did not know.</p> <p>Staff has been working closely with C&S Companies to prepare the Hangar 3 Needs Assessment. This report assesses the following:</p> <ul style="list-style-type: none">• reviews existing aircraft fleet mix• provide site layout alternatives and configurations of the hangar• reviews existing hanger layout in relation to our aircraft inventory• estimates construction costs		

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- estimate annual operating and maintenance costs
- determines appropriate rental rates
- estimates potential financial return scenarios

Corey Hazelwood of C&S Companies will be at the meeting to present his findings and a summary of the report. He will also answer any questions posed by the public or the Board.

In reviewing the data provided in the report including the absorption rate, staff feels confident in the numbers and potential revenue projected. It should be understood that this is staff's and the consultant's best educated estimate of revenue potential. Staff is most comfortable with estimating the absorption rate based on actual overnight data from previous years collected from the Airport Districts point-of-sale. We feel confident that many of our targeted aircraft per the Assessment will park in the new hangar once they know it is available. This will be particularly true during winter months but will also be true in the summer months to a lesser extent.

Staff has reviewed and analyzed the various community uses of the facility. Staff anticipates anywhere from 7 to 12 events in the building per year. Based on the addition of a new staff member once the building is constructed as identified in the assessment, staff feels it can handle the additional workload of events along with the increased workload of repositioning aircraft. Staff is still analyzing whether or not a fee should be charged and what it might be. Any associated fees for community use of the building will be presented to the Board before implemented by staff. Striking a balance with community benefit and cost recovery will be carefully considered by staff.

If the board decides to move forward with this project, Staff will also be working very closely with our local emergency management agencies to assure the building is optimized to handle the various emergency management scenarios and natural disasters applicable to our area.

Fiscal Impact	The Board budgeted \$375,000 in the FY 2014 budget for design and bidding of a multipurpose community hangar. Approximately \$15,000 of this funding has been expended on the Needs Assessment. If approved, staff will use the remaining funds through an RFP process to retain an architect and contractor to assist with the design and bidding of the project. Once bids are received the Board will then make the decision at a future meeting of whether or not to construct Hangar 3.
Communication Strategy	As mentioned, this topic has been well discussed in various public meetings and in our Master Plan Outreach Meetings. While there

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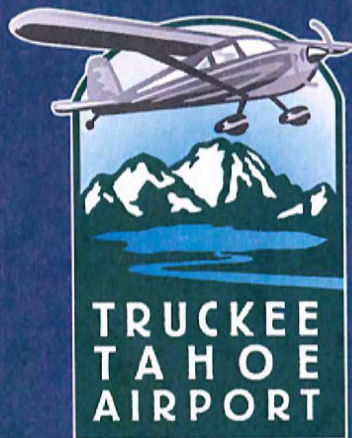
have been various public discussions about this project, if the Board feels a targeted outreach effort regarding the Boards consideration of moving into the design and bidding phase of this project is desired, staff can work on such a program.

Regarding the design process, should the Board decide to move in that direction, staff will work very closely with aircraft operators, community groups, nonprofits, our local emergency management agencies, and internal staff. These key stakeholders will be very important in the design of the facility to assure it can meet the needs and demands of all intended users.

Attachments

Hangar 3 Needs Assessment

Existing & Future Hangar Resource Chart by Aircraft Type



Truckee Tahoe Airport Hangar 3 Needs Assessment February 2014



Prepared by:
C&S Engineers, Inc.
8880 Cal Center Drive
Suite 400
Sacramento, CA 95826



Section 1 - Introduction

In the United States today, many general aviation (GA) airports struggle to determine the best course of action to increase the usage and economic viability of their facilities. The business aviation industry contributes \$150 billion to the U.S. economic output and employs more than 1.2 million people across the nation. Truckee Tahoe Airport is recognized as an important part of the national airspace system, and has significant financial impacts on the local community and businesses.

The Truckee Tahoe Airport District (TTAD) selected C&S Companies to provide guidance, requirements, and financial implications for a new business aircraft hangar, additional ground support equipment (GSE) storage area and joint-use community center at Truckee Tahoe Airport. Truckee Tahoe Airport is a community airport that currently provides high-quality aviation facilities and services to the local and public national airspace system.

The Town of Truckee 2025 General Plan projects a two-percent annual growth rate in population and a 2.4-percent annual increase in residential housing; both factors would influence and enhance aviation activity at the airport. The airport also experienced an increase in jet and turboprop activities over the past two years. According to the National Business Aviation Association 2013 survey, national trends further support this upswing for business aircraft through 2030.

This business aircraft hangar, GSE storage area and joint-use community center assessment considers the following areas:

- Reviewing the existing aircraft fleet mix
- Providing layout alternatives that address the size and configuration of the proposed hangar and optimize the existing hangar configuration
- Reviewing existing hangar layout and aircraft inventory
- Estimating construction cost of a new hangar
- Estimating annual operating and maintenance cost of a new hangar
- Determining appropriate rental rates
- Identifying financial return and potential impact of additional operational costs

Section 2 - Existing Aircraft Fleet Mix

To develop our recommendations, C&S used the 2012 and 2013 annual operation reports as approved by the Board of Directors and a draft copy of the Aviation Demand Forecast dated February 2014, which were provided by Mead and Hunt as part of the ongoing Master Plan Update.

The 2012 and 2013 annual Operations Reports during this study were reviewed and analyzed by total aircraft operations by aircraft type. These categories include touch-and-go, tow plane (glider), single-piston engine, multi-piston engine, turboprop, helicopter, and business jet operations. The 2012 report also separates the operations into daily arrivals, daily departures, and total operations.



C&S made the following assumptions:

- The operations related to touch-and-go, tow plane, and helicopter activity do not impact or influence the current hangar needs. The operations related to the single-piston engine aircraft and the multi-piston engine aircraft do not need to be considered when reviewing the needs and requirements for a new hangar facility. Typically the single-piston engine and multi-piston engine aircraft are stored in T-hangar units, box hangar units or tie-downs.
- There are 12 existing multi-unit (row) hangar buildings, which comprise 197 T-hangar units and 20 box hangar, or “executive hangar,” units. There are eight rows of exclusively T-hangar units, two rows of a combination of T-hangar units and box hangar units, and two rows of exclusively box hangar units. The T-hangar units primarily house the light piston aircraft and the box hangars house the multi-piston engine and small turboprop aircraft.
- Presently, there are 202 based aircraft at the airport including a combination of both seasonal aircraft and home-based aircraft. There is also a waiting list of 15 aircraft for the box/conventional hangar or “executive” type hangar units. If there is a demand for additional hangar space for the single-piston engine and multi-piston engine aircraft, C&S assumes new T-hangars and box hangars would be constructed to support these needs.
- For this report, C&S will be using the data related to the turboprop operations and business jet operations. The business jet operations are divided into three separate categories: less than 12,499 pounds; 12,500 to 19,999 pounds; and more than 20,000 pounds.

The 2012 Operations Summary Report indicated there were:

- 2,866 total operations by turboprop aircraft
- 406 total operations by business jet aircraft weighing less than 12,499 pounds
- 590 total operations by business jet aircraft weighing between 12,500 and 19,999 pounds
- 536 total operations by business jet aircraft weighing more than 20,000 pounds

The 2013 Operations Summary Report indicated there were:

- 3,036 total operations by turboprop aircraft
- 1,046 total operations by business jet aircraft weighing less than 12,499 pounds
- 946 total operations by business jet aircraft weighing between 12,500 and 19,999 pounds
- 974 total operations by business jet aircraft weighing more than 20,000 pounds

The total number of operations for turboprop aircraft and business jet aircraft increased overall. The increase in the total number of aircraft operations can be attributed to the increase in Part 91K operations (fractional ownership aircraft) from companies like Flex Jets, NetJets, JetSuites, Flight Options, and the short term closure for reconstruction of the main runway during 2012. C&S has factored the increase into the report with the understanding that this could be skewed due to runway closure.



Section 3 - Absorption Rate Evaluation

A key factor in justifying hangar needs for an airport is the calculation of “absorption rate.” Absorption rate is the assumption of how many targeted users operate in and out of the airport that would be a contender for transient overnight inside a community storage hangar.

C&S reviewed the absorption rates of other airports within the airport service area with transient-type hangars. The airport service area is defined as the area within a one-hour driving distance in good weather conditions of the Truckee Tahoe area. These other airports were evaluated in order to consider the potential competition for targeted users within this service area. Although Truckee Tahoe is considered a more desirable area and the airport provides a high level of services and aviation facilities, it is still important to assess potential competition. During this data collection C&S found that only one airport within the service area currently has a transient hangar offering available, which is offered by a Fixed-Base Operator (FBO). This transient hangar offering was at Carson Airport through Sterling Air. The current available size would likely be capable of housing one Challenger 604 or two Phenom 100s. It was unclear if the occupancy differs from season to season and/or during peak periods.

Airport Service Area - Sectional Chart



C&S also learned during this assessment that an FBO provider at Reno Tahoe International Airport is currently constructing a new transient aircraft storage facility. This facility is being constructed by Atlantic Aviation Corporate due to high occupancy demand and overflow needs of their existing facility during peak seasons. During this data collection C&S was able to determine the assumed rental rates for transient at Atlantic based on the proposed new hangar. These rates are reference in section 9. C&S does not consider Reno Tahoe Airport a competition threat to the Truckee Tahoe Airport at this time or following the development of their proposed hangar. However, it is important to validate other area airports with similar servicing capabilities that could pose as threat in the future. Industry studies have proven that business aircraft users prefer direct destination with limited drive travel and therefore if the option was available for transient overnight hangar at Truckee Tahoe Airport we consider Reno Tahoe International Airport Atlantic Aviation facility as a low threat. In addition, based on C&S's findings, the competition within the airport service area was determined to also be low and will therefore be omitted as a factor for calculation in this study.

Based on operational data provided by TTAD, C&S calculated the total annual operations of targeted aircraft that could potentially have interest in transient hangar use. The targeted aircraft C&S profiled include turboprop aircraft and business jet aircraft. Based on the overall total of 2012 and 2013 operations (approximately 5,000), there is an average of 13.7 daily operations by these targeted aircraft operating into and out of Truckee Tahoe Airport. However, we assume this to be 2,500 visits to the Truckee Tahoe Airport in 2013. This equates to an average of 6.9 visits per day, not considering any seasonal peaks. C&S understands that not all of these targeted aircraft visit would be interested in overnight storage



therefore, we have reduced this by 75% as an industry absorption practice. This now calculates and average visit per day of 1.7 targeted aircraft that are likely to overnight park inside a hangar.

In addition to the average daily operational count, C&S reviewed the data provided from the 2012 draft master plan being conducted by Mead and Hunt. This data presents seasonal highs and lows that are important factors in determining absorption rate. Based on our experience preparing such reports for other seasonal airports we always review the operational season highs and lows of targeted aircraft activity. Below is a graphical summary of the historical operations of the targeted aircraft that would be possible candidates for a business aircraft hangar.

2012 Monthly Operations for Targeted Aircraft

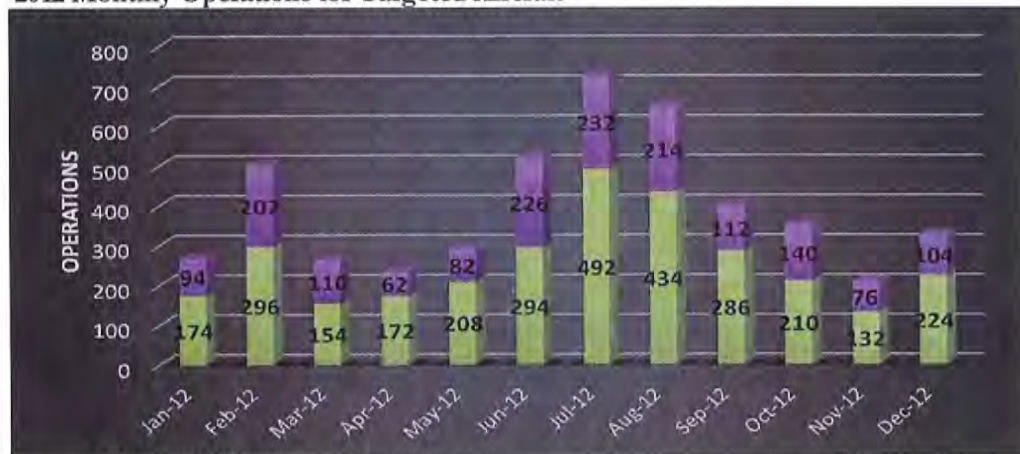


Image and data provided from current Master plan update

The purple denotes business jet aircraft and the green denotes turboprop aircraft all within the three operational aircraft weight categories described in section 2. These calculations are based on historical data provided by TTAD and does not include users of other potential airports within the airport service area that may choose to overnight at Truckee Tahoe Airport. C&S believes that if Truckee Tahoe were to have a business aircraft hangar offering that the relocation flights could decrease at the airport. This information is supported based on discussions that C&S had with Flex Jet, Jet Suite, and Net Jets. All these fractional providers affirmed that repositioning would not occur as frequently at Truckee Tahoe if a hangar was available for transient overnight. The potential reduction from repositioning would also balance out the possible operations that could increase from other interested business aircraft should a hangar be developed at Truckee Tahoe Airport. This increase would come from the catchment within the service area of business aircraft using a less desirable location based solely on the fact that a hangar was available for overnight parking.

Historical Overnight Data Results

C&S also reviewed and considered 2013 historical data provided by TTAD regarding specific overnight visits from fractional operators. This historical data was calculated based on an assumption that if a transient hangar was available in 2013 these aircraft would have chosen to overnight inside in lieu of on the apron. We took the total aircraft visits and reduced them by 50% to demonstrate conservative absorption of aircraft that may in fact choose to overnight within a hangar. C&S then reduced this an additional 10% to consider the potential saturation.



Truckee Tahoe Airport – Business Aircraft Hangar Needs Assessment

Below is a summary of the historical data placed into a proforma to demonstrate a more firm calculation based on the actual fractional numbers from 2013.

TRUCKEE TAHOE AIRPORT DISTRICT

2013 OVERNIGHT AIRCRAFT DATA

CUSTOMER	TD 2	TD 3	TD 4	TD 5	A-9 Exec. Hgr	Hangar 1 Heated *
CITATIONS SHARES SALES	0	0	5	6	0	0
FLEX JET	0	0	4	0	0	0
FLIGHT OPTIONS	0	11	8	0	0	0
JET SUITE	8	1	0	0	5	0
NET JETS	0	11	44	0	7	0
X.O. JET	0	0	0	0	0	0
	8	23	61	6	12	0
ACTUAL						
OVERNIGHT RAMP FEE BY TD	\$20.00	\$35.00	\$50.00	\$100.00	\$100.00	\$50/hr-\$300/nt
TYPE AIRCRAFT COMPARISON FOR HGR PRICING	PC-12	CJ-IV	C-604	G-V	CJ-IV	
ANNUAL 2013 NIGHTLY TD TOTALS	240	122	195	46	83	11.5
ANNUAL REVENUE TOTALS FROM NIGHTLY TD'S	\$4,800	\$4,270.00	\$9,750.00	\$4,600	\$8,300.00	\$1,075

* Hangar 1 Heated rental through August 31, 2013 after that date Sierra Aero occupied the hangar

ESTIMATED

EST. NIGHTLY FEES FOR Hgr3 *based on comparative analysis

\$330.00	\$520.00	\$730.00	\$850.00	\$520.00
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	120	61	97.5	23	41.5	Potential Hgr3 Total Annual Revenue
REDUCE 50% TO DEMONSTRATE CONSERVATIVE ABSORPTION						
TOTAL POTENTIAL REV - W/50% REDUCTION PER AIRCRAFT	\$39,600.00	\$31,720.00	\$71,175.00	\$19,550.00	\$21,580.00	\$183,625

	96	48.8	39	9.2	16.6	
REDUCE 60% TO DEMONSTRATE 50% CONS. ABSORB +10% Saturation						
TOTAL POTENTIAL REVENUE - W/60% REDUCTION PER AIRCRAFT	\$31,680.00	\$25,376.00	\$28,470.00	\$7,820.00	\$8,632.00	\$101,978

** Saturation considers that Hangar 3 space may not be available

Layout Considerations

Several factors affect the size of the proposed hangar including identification of the largest aircraft requiring storage and the need to maximize the number of business jet aircraft that can be stored.

The largest aircraft being considered for storage in the new hangar is a Gulfstream G-V. The G-V has a wingspan of 93.5 feet, an overall length of 96.5 feet, and a tail height of 25.9 feet. Based on these dimensions, the hangar door would need a minimum height of 28 feet and a minimum door opening of 110 feet. A 110-foot-wide hangar door would require the minimum width of the hangar building to be approximately 120 feet wide.

To maximize the number of aircraft stored inside the hangar building, C&S assumed an average aircraft footprint of 2,800 square feet or less. This allows a maximum of four aircraft to be stored inside the hangar at one time. The 2,800-square-foot aircraft footprint would accommodate all of the turboprop and business jet aircraft weighing less than 19,999 pounds, and several types of smaller business jet aircraft weighing more than 20,000 pounds. Assuming five aircraft with an average footprint of 2,800 square feet would require a minimum hangar floor area of 14,000 square feet. These assumptions would allow a Pilatus PC-12, Cessna Citation II or III, Challenger 604, and two Embraer Phenom 100s to use the hangar at one time.



Based on the minimum building width of 120 feet for the hangar door and the minimum floor area of 14,000 square feet needed to store four aircraft inside the hangar, a hangar size of 120 feet by 120 feet (14,400 square feet) will be used for this study. The largest design aircraft, the Gulfstream G-V, can be accommodated inside the hangar, but to achieve this, the number of total aircraft stored must be reduced to two or three, depending on the size of the other aircraft inside the hangar.

The following is a summary of the proposed building sizes for the proposed hangar building, GSE storage area, and the community area (referred to as Hangar 3 facility).

- The size of the hangar building would be 120 feet wide by 120 feet deep, for a total hangar floor area of 14,400 square feet. The hangar door would be 28 feet high by 110 feet wide to accommodate the largest design aircraft, a Gulfstream G-V.
- The GSE storage area size would be 30 feet wide by 48 feet long for a total building area of 1,440 square feet.
- The size of the community area would be 30 feet wide by 120 feet long for a total floor area of 3,600 square feet.

There are two possible alternatives for the location of the proposed Hangar 3 facility (see attached Conceptual Site Plan). The alternatives detailed below are considered the most practical considerations based on location. C&S reviewed, sited, and analyzed other alternatives, but removed these from consideration due to ingress/egress impacts and future expansion limitations to other tenants and/or operators at the airport.



Alternative I

Alternative I positions the proposed hangar, GSE storage area and community area just south of the current ramp area, east of the existing General Aviation Terminal Building and adjacent to the current park/play area. The existing Hangar 2 building would need to be either relocated or demolished to construct the proposed hangar and community area. The advantages of this location include:

- Provides direct access to the current ramp area that extends past the current terminal building.
- Involves minimal cost to extend and tie in the existing utilities to the new building and provides direct access from the community area to the existing park/play area.
- Uses existing, newly constructed apron area.
- Extends the community park area.
- Minimizes impacts to the ingress and egress traffic to the existing southeast aircraft storage hangars.
- Creates a connection between the recently constructed airport terminal building, the community park and this proposed community hangar.



The disadvantages with this location include:

- Hangar 2 would need to be relocated and/or demolished before the new hangar building could be constructed.
- There would be a loss of 11 existing vehicle parking stalls in the new footprint.
- The vehicle access control gate would need to be reconfigured to accommodate this construction and vehicle access.

C&S also was asked to consider an Alternative IA. This alternative only excludes the community area and GSE storage area for both hard and soft cost. The justification for this request was to consider the hangar only alternative for financial return on investment.

Alternative II

Alternative II would locate the proposed hangar and community area adjacent to the existing T-hangars in the undeveloped area along the western edge of the current apron. The advantages of this location include:

- The new hangar and community area can be constructed without removing or demolishing existing facilities.
- There will be no loss to the existing parking configuration.



The disadvantages with this option include:

- It would be difficult to maneuver aircraft both for the storage of this hangar and for the current hangar tenants along the adjacent row. This difficulty will only increase as operations continue to increase and transient users consider this hangar.
- The existing T-hangar taxiway and ramp area would need to be reconstructed to accommodate the recommended load capacity. This would include a new PCC concrete apron area (approximately 11,000 square feet). A separate cost estimate for the recommended treatments of this area is included at the end of this document.
- Pavement leading up to the proposed hangar building would need to be reconstructed to accommodate the larger and heavier aircraft using the new hangar, and the existing open flow ditch along the west ramp area would need to be rerouted since it is currently located inside the proposed building footprint. As an undisturbed area this may require further environmental investigation before finally considering this as a viable option.
- Necessary draining redesign would be required to accommodate the current catch channel within the proposed footprint of this facility.

Alternative III



Alternative III reduces the usable area of the hangar building and the maintenance building. The same criteria were used in establishing the size of the hangar, except the intent was to reduce the number of stored aircraft in the hangar to four airplanes and to minimize the overall footprint of the hangar building.

The width of the hangar would remain at 120 feet to accommodate the hangar door size required for a Gulfstream G-V aircraft, which is a door height of 28 feet and a door opening width of 110 feet. The depth of the hangar would be reduced by 20 feet to a depth of 100 feet. This reduced hangar floor area would still allow the storage of up to four aircraft at one time, such as one Pilatus PC-12, one Cessna Citation II, and two Embraer Phenom 100s. The reduced hangar floor area would be approximately 12,000 square feet.

The largest design aircraft, the Gulfstream G-V, can still be accommodated inside the hangar but would allow for no other aircraft.

Under this alternative, the size of the GSE storage area would also be reduced. The revised size of the building would be 30 feet wide by 40 feet long. The building would still have two insulated, motor-operated overhead sectional doors measuring 12 feet wide and 14 feet high. The reduced maintenance building floor area would be approximately 1,200 square feet.

The size of the community area would remain unchanged, but reconfigured to match the length of the common wall between the community area and the hangar building. The revised dimensions of the office spaces within the community area would be 36 feet wide by 100 feet long. The unchanged floor area of the community area would be approximately 3,600 square feet.

The advantages for reducing the building area include:

- Reduced building size would result in a \$345,800-reduction of the overall project cost.
- No vehicle parking stalls would be removed.
- All of the other advantages outlined under Alternative I would remain:
 - Provides direct access to the current ramp area which extends past the current terminal building.
 - Involves minimal cost to extend and tie in the existing utilities to the new building and provides direct access from the community area to the existing park/play area.
 - Uses existing, newly constructed apron area.
 - Extends the community park area.
 - Minimizes impacts to the ingress and egress traffic to the existing southeast aircraft storage hangars.
 - Creates a connection between the recently constructed airport terminal building, the community park and this proposed community hangar.

The disadvantages for reducing the building area include:

- A maximum of four small aircraft could be stored inside the hangar.
- Only one Gulfstream G-V could fit inside the hangar, but to achieve this no other aircraft can be stored inside the hangar.
- The following disadvantages outlined under Alternative I would remain:
 - Hangar II would have to be relocated and or demolished before the new hangar building could be constructed.



- The vehicle access control gate would need to be reconfigured to accommodate this construction and vehicle access.

All building location alternatives would require additional parking to support the proposed building use as a community area. For initial planning, a new 60-car parking lot is proposed, which would be located on the undeveloped land south of the current parking and drive.

Alternatives I and II use the same hangar and community area floor plan layout. Alternative III reduces the overall size of the proposed hangar for a possible cost reduction consideration. The variable factors are the costs to develop and improve the site around the building. (See the attached Floor Plan Layout.)

Section 4 - Estimation of Construction Cost

Construction cost considerations is a key factor when preparing this needs assessment. C&S has determined that Alternative I was the cost effective alternative for site location development. Therefore, below is a construction inclusion description for each element of the facility for Alternative I. These descriptions are based on C&S industry experience with business aircraft hangar development and conversations with TTAD staff to understand the potential needs for this specific facility. The engineer's opinion of both hard and soft development cost is also presented below and will be considered during the section 6 on financial return.

Hangar Facility

The new hangar facility is designed to accommodate a maximum of five turboprop and business jet aircraft. The aircraft types that would be considered include Pilatus PC-12, Cessna Citation II or III, Challenger 604, two Embraer Phenom 100s or aircraft of similar sizes. The hangar building would include a pre-engineered metal building equivalent to a Butler Manufacturing building system. The hangar could be 120 feet wide by 120 feet deep, with an eave height of 33 feet and a total building height of 40 feet. The building would include a 120-foot clear-span rigid framed, pre-engineered structural framing system to provide an open, column-less floor area. The exterior walls around the hangar could consist of a full-height architectural metal wall panel system with blanket insulation. On the inside of the hangar, around the perimeter of the building, could be an eight-foot-high interior metal liner panel. The roof could consist of a metal standing seam roof system with blanket insulation.

The clear span structure would be designed in accordance with the International Building Code (IBC), ASCE 7-05 "Minimum Design Loads for Buildings and Other Structures," and local building code requirements for roof loads, snow loads and wind loads.

The recommended hangar door would be a single-slide, motor-operated door measuring 110 feet wide by 28 feet high, divided equally into four separate door panels. The exterior face of the hangar door would be covered with the same metal wall panel to match the rest of the exterior walls of the hangar building. The south side of the hangar (backside of building) would have one insulated, motor-operated, overhead sectional door measuring 12 feet wide by 14 feet tall. Two pedestrian entrance/exist doors would also be provided.

The floor inside the hangar would be designed as 10-inch-thick reinforced concrete designed to support the wheel loads of the fleet aircraft. The proposed fire protection system is a foam



system with sprinkler heads located below the roof and will comply with National Fire Protection Association (NFPA) requirements for this type and size of hangar facility. The electrical system includes high-bay fluorescent lighting, power required for GSE storage area, convenience outlets and exit/emergency lighting as required by the local building codes. The hangar could also be equipped to include an infrared heating system and a ventilation system.

GSE Storage Area

The GSE storage area would be constructed as a pre-engineered metal building similar to the hangar building. A GSE area is necessary when considering a hangar for business aircraft storage. The GSE will house and maintain the equipment associated with servicing and aircraft towing operations. In several cases airports and or FBO's will have a general GSE for the airport but it should be located at or near the transient aircraft hangar. The size of the building would be 30 feet wide by 48 feet long, with an eave height of 20 feet. The building would have two insulated, motor-operated, overhead sectional doors measuring 12 feet wide by 14 feet high. Additionally, there would be one 8-foot-by-8-foot rolling steel fire door between the hangar and the maintenance building. Inside the maintenance building would be a unisex toilet room and a room to store the aircraft lavatory cart.

Community Area

The community area would be attached to the hangar building and would also be constructed using a pre-engineered metal building framing system. A community area was brought forward to C&S when developing the alternatives for the hangar. We have considered that the entire hangar would possibly be used for periodic large community events, but this additional area could be used for emergency operations center for potential catastrophic events, educational community events, and or just general airport community gatherings. In the cost scenarios referenced below we removed this in Alternative I and in Section 6 for financial return. C&S believes that should the TTAD make a decision on additional area for both a community room and GSE it should not be considered in the financial recovery proforma. The recovery cost should be solely related to the aircraft hangar. The size of the office area would be 30 feet wide by 120 feet long, with an eave height of 18 feet. The metal standing seam roof system could include a blanket insulation matching the hangar roof color. The exterior walls of the community area would be full-height block walls with cut stone exterior finish to match the existing terminal building and would have aluminum-framed, low-E insulated windows measuring four feet high by eight feet wide.

The interior of the community area would include:

- A vestibule & lobby
- Community meeting room for 75 to 100 people
- Food preparation area with roll-up service windows
- Counter space
- Stove with range hood (optional)
- Refrigerator/freezer and sink
- Two storage rooms
- Men's and women's toilet rooms
- Five future offices (these were considered to be included for future emergency operations activities and potential revenue generation)
- Mechanical/electrical room



The typical finishes would be metal stud and painted gypsum board walls, lay-in acoustical ceilings with T-8 fluorescent lay-in light fixtures; carpet in the meeting room and all office areas; and ceramic tile in the toilet rooms, kitchen and lobby. The electrical service would



include lighting in all spaces; power, phone and data outlets in all offices and the meeting room; and convenience outlets in the kitchen. The community area would be fully sprinkled with a wet fire protection system. The entire area would have a zoned heating and air conditioning system with ductwork, diffusers and temperature controls.

Site Work

A new 60-car asphalt parking lot would need to be constructed with drive adjacent to the new hangar and community center and the

existing parking lot and drive. Included in the parking lot would be handicapped-accessible parking stalls. Landscaping would be provided around the parking lot and along the community area and hangar building in accordance with the local landscape ordinance. The sanitary sewer, waterline, electrical service, gas service, telephone and security would be extended from the existing utilities located onsite to the new building. There would also be required site clearing, grading and engineered fill to construct the new building.

Hard Cost Estimate (Alternative I – Recommended)

Estimated Construction Budget Summary (see attached estimates, based on prevailing rates)

Alternative I Project Cost Estimate	
Removal of Hangar 2	\$30,000
Hangar Building – 14,850 square feet × \$135/ square feet	\$2,004,750
GSE Storage Area – 1,440 square feet × \$95/ square feet	\$136,800
Community Area – 3,600 square feet × \$135/ square feet	\$ 486,000
Site Work (W/use of current Apron)	\$ 251,000
Total Estimated Construction Cost	\$2,908,550

Hard Cost Estimate (Alternative IA)

Estimated Construction Budget Summary with **exclusion community area, necessary site improvements, and GSE area.**

Alternative IA Project Cost Estimate	
Removal of Hangar 2	\$30,000
Hangar Building – 14,850 square feet × \$135/ square feet	\$2,004,750
GSE Storage Area – 1,440 square feet × \$95/ square feet	\$ 0
Community Area – 3,600 square feet × \$135/ square feet	\$ 0
Site Work based on hangar footprint only (W/use of current Apron)	\$ 220,000
Total Estimated Construction Cost	\$2,254,750



Alternative II Project Cost Estimate	
Hangar Building – 14,850 square feet × \$135/ square feet	\$2,004,750
GSE Storage Area – 1,440 square feet × \$95/ square feet	\$136,800
Community Area – 3,600 square feet × \$135/ square feet	\$ 486,000
Site Work (drainage, infrastructure, grading for future site)	\$ 297,000
Required Taxilane and Apron Improvements	\$ 492,000
Total Estimated Construction Cost	\$3,416,550

The cost associated with Alternative III, has been calculated to show a reduced hangar footprint for TTAD consideration. See estimated hard cost referenced below.

Hard Cost Estimate (Alternative III)

Estimated Construction Budget Summary (see attached estimates, based on prevailing rates)

Alternative III Project Cost Estimate	
Removal of Hangar 2	\$30,000
Hangar Building – 12,450 square feet × \$135/ square feet	\$1,680,750
GSE Storage Area – 1,200 square feet × \$95/ square feet	\$114,000
Community Area – 3,600 square feet × \$135/ square feet	\$ 486,000
Site Work (Not including any apron improvements)	\$ 251,000
Total Estimated Construction Cost	\$2,561,750

Section 5 - Estimation of Annual Operating Cost

This section was prepared in order to consider the potential operational and maintenance cost that this new development would require on an annual basis. This is an estimation based on information collected from TTAD, the utility providers and C&S internal systems in preparing such studies for other facility operators. The assumptions for staffing, insurance, and maintenance were all based on the specifics for this building and the operational use.

Estimated Cost Burdens—20,000-sf facility with community room	
Estimation of annual utilities (based on data collected from TTAD)	\$5,200.00
* Estimation of required staffing (3/4 time operations personnel)	\$47,000.00
Estimation of annual cleaning/maintenance supplies	\$6,000.00
Estimation of operator equipment/building maintenance	\$3,400.00
Hangar insurance	\$4,000.00
Total estimation of annual operating cost	\$65,600.00

** C&S believes based on the current staffing inventory for TTAD that an employee will be required for support of this facility a minim of 20-32 hours a week.*



Estimated Cost Burdens—Hangar only	
Estimation of annual utilities (based on data collected from TTAD)	\$2,900.00
* Estimation of required staffing (3/4 time operations personnel)	\$47,000.00
Estimation of annual cleaning/maintenance supplies	\$2,100.00
Estimation of operator equipment/building maintenance	\$2,400.00
Hangar insurance	\$3,800.00
Total estimation of annual operating cost	\$58,200.00

Section 6 - Financial Return

This section would look at the estimated capital investment and annual operating cost based on information collected from TTAD. In order to calculate what we believe is a more precise return of investment (ROI), C&S assumed the seasonal peak periods based on the operational data collected from TTAD. This information does not consider a financing lending model. Should the TTAD consider financing this project then a proforma calculated the loan rates should be considered in the return model. C&S was under the assumption when preparing this report that financing this was not a consideration by TTAD.

Estimation of Return of Investment (ROI) Scenario I	
Capitol Construction Cost (Hard)	-\$2,908,550.00
Architectural/Engineering/ Construction Management (soft)	-\$349,000.00
Plan check and permits (typically based on 1% of hard cost)	-\$28,000.00
Annual Operating and Maintenance Cost over 10 years	-\$534,000.00
Total Potential Investment Cost	-\$3,819,550.00
* ROI Method I (Based on 1.7 target aircraft visits a day/365)	\$317,075.50
Year estimation of ROI	12 years
** ROI Method II (Based on historical overnight data 50% reduction)	\$183,625.00
Year estimation of ROI	21 years
** ROI Method III (Based on historical overnight data 60% reduction)	\$101,978.00
Year estimation of ROI	37.5 years

*Calculation based on the average of the medium price column referenced in section 9 = \$511 per night

**Calculation based on the historical overnight data provided in Section 3 absorption rates

Estimation of Return of Investment (ROI) Scenario IA	
Capitol Construction Cost (Hard)	-\$2,254,750.00
Architectural/Engineering/ Construction Management (soft)	-\$288,000.00
Plan check and permits (typically based on 1% of hard cost)	-\$22,000.00
Annual Operating and Maintenance Cost over 10 years	-\$472,000.00



Total Potential Investment Cost	-\$3,036,750.00
* ROI Method I (Based on 1.7 target aircraft visits a day/365)	\$317,075.50
Year estimation of ROI	9.5 years
** ROI Method II (Based on historical overnight data 50% reduction)	\$183,625.00
Year estimation of ROI	16.5 years
** ROI Method III (Based on historical overnight data 60% reduction)	\$101,978.00
Year estimation of ROI	

*Calculation based on the average of the medium price column referenced in section 9 = \$511 per night

**Calculation based on the historical overnight data provided in Section 3 absorption rates

Section 7 - Safety and Liability exposure

Safety is always a top priority in aviation, with pilots, aircraft, and the airport operators. This needs study does not include a complete safety analysis, however we have considered a section below for TTAD to consider regarding safety and liability exposure.

Insurance/Safety Plan

C&S recommends that the Truckee Tahoe Airport district consider developing an aircraft operations safety plan/program for the movement and placement of both fixed and roto aircraft inside the potential hangar. This aircraft operations safety plan/program would highlight the personnel equipment training, equipment inspections, and passenger control to and from the aircraft while inside the potential hangar.



In addition to implementing a training program, we encourage two policies for the potential hangar. The first policy would include standard hangar property insurance. This type of insurance typically covers (based on your coverage needs) damages from wind, snow, hail, fire, etc. The second insurance policy is hangarkeepers insurance. This type of policy would typically cover liability from damages incurred to other aircraft within your care or in the hangar facility.

C&S encourages the TTAD to consider full consultation with an aviation insurance professional who would be able to clarify any concerns associated with liability regarding the movement of aircraft. Developing this facility, owning, and operating it does not create any unordinary exposure for the TTAD as long as proper insurance requirements are met to mitigate all potential risk.

Anti-Icing

There has been discussion with the airport about offering some form of anti-icing or de-icing service for transient aircraft. De-icing outside on the ramp should be performed in a designated area. The collection and cleanup of the used de-icing fluid would need to be



controlled to prevent any contamination of ground water and infiltration into the storm water drainage system.

An alternate solution to remove snow and ice from aircraft, which does not use chemicals like Type IV glycol, would involve utilizing the radiant heating system installed inside the hangar building. The heating system inside the hangar uses gas fired, infra-red radiant tube heaters that are suspended from the underside of the hangar roof and extend across the width of the hangar area. The heaters radiate heat down from the continuous tubes mounted in the ceiling and heat the objects below. A conventional heating system heats the air and moves the heated air by fan. The infra-red heating system heats the objects, like the floor, people, equipment and aircraft, which are located directly below the heating tubes. To use the building heating system to remove snow and ice from aircraft, the aircraft would be pulled inside the hangar, the hangar door would be closed and the heating system would be turned on. It would take several hours to radiate enough heat to warm the aircraft to eventually melt the snow and ice on the aircraft exterior. The heating system is inexpensive to operate and the only residual liquid left on the floor from melt the snow and ice is water. C&S would recommend the use of the hangar building's infra-red heating system as the preferred method to anti-ice the aircraft.

Section 8 - Determination of Rental Rates

This section will cover the assumed rental rates based on research within the region, airport service area and other similar airports in Country. Determining rental rates is an important component in factor the needs and ROI). This section demonstrated three levels of the assumed short-term and long-term rental rates for TTAD should a hangar be constructed.

Short-Term Transient Assumed Rates

Short-term transient rent is defined as a short-term rest over night (RON) period with no contractual lease arrangement with TTAD. The foundation of these low, med and high transient hangar rental rates that have been assumed come from C&S research information of airports within the service area and our database collection of what we consider similar destination airports to Truckee Tahoe. These calculated assumptions have proven to be within practical percentage with past private and public aviation developers. The typical average overnight storage at airports similar to Truckee Tahoe Airport guided the recommended rates shown below for transient charge. The recommended range to consider for short term transient aircraft is \$.140; \$.160; and \$.185 per square foot area of aircraft footprint (length X width = footprint). This is a per night rate.

Recommended per night rate examples (rounded):

Aircraft Model	Est. Coverage Area (square feet)	Low	Med	High
Challenger 604	4,400	\$620	\$705	\$815
Pilatus 12	2,070	\$290	\$330	\$380
Citation X	4,620	\$650	\$739	\$855
Phenom 100	1,700	\$240	\$272	\$315

Per night pricings do not include servicing (e.g., cleaning, lav services, de-icing, etc.). Lavatory dump service ranges are found to be from \$40 to \$60 per dump based on holding size per aircraft in this region. It is recommended that the TTAD conduct outreach to local aircraft



cleaning firms to include on a qualified vendor list for an offering to both short term and long term.

Alternative revenue sources were also discussed during C&S evaluation of the study. In our experience we have seen different methods for hangar fee collection, however we encourage following all FAA grant assurances in order to continue to be a compliance NPIAS airport. Here are a few methods of consideration:

- Annual Hangar Membership – Level Priority based system
- Short period infra-red heating inside the hangar
- Private events
- Commercial filming

Long-Term Assumed Rental Rates

Long-term rent is considered a contractual lease arrangement in the industry. This could be a periodic agreement for peak stays with a locked rate or this could be an arrangement for a month-to-month term. This of course depends on the decision of TTAD on what makes sense for Truckee Tahoe Airport. In the industry it is a decision of the hangar owner on what makes financial sense for maintaining a high aircraft absorption rate. C&S looked at competitive similar airports within the service area and current market rates in the western pacific region. The recommended ranges for long term aircraft are \$.75; \$.90; and \$1.10 per square foot per month based on aircraft footprint (length X width = footprint). C&S believes that long-term leasing is not something to consider at this time for TTAD, but we wanted to give TTAD the potential rental monthly rates that could be considered if this was chosen.

Aircraft Model	Est. Coverage Area (square feet)	Low	Med	High
Challenger 604	4,400	\$3,300	\$3,960	\$4,840
Pilatus 12	2,070	\$1,553	\$1,863	\$2,277
Citation X	4,620	\$3,465	\$4,158	\$5,082
Phenom 100	1,700	\$1,275	\$1,530	\$1,870

Section 9 - Conclusion and Recommended Actions

Given the lack of competition within the service area, the historical activity and supporting targeted fleet mix, C&S has determined that there is adequate demand for a new aircraft hangar at Truckee Tahoe Airport. C&S has used all available data collected from the TTAD and considered our industry expertise for hangar absorption to determine our recommendation. Below are some of the key considerations for this study:

- The airport has seen an increase in operations in recent years
- TTAD and C&S have verified with fractional providers that it is more feasible at times to overnight park inside a hangar rather than to reposition for the customers
- The service area is for hangar offerings is considered a low threat to the Truckee Tahoe Airport



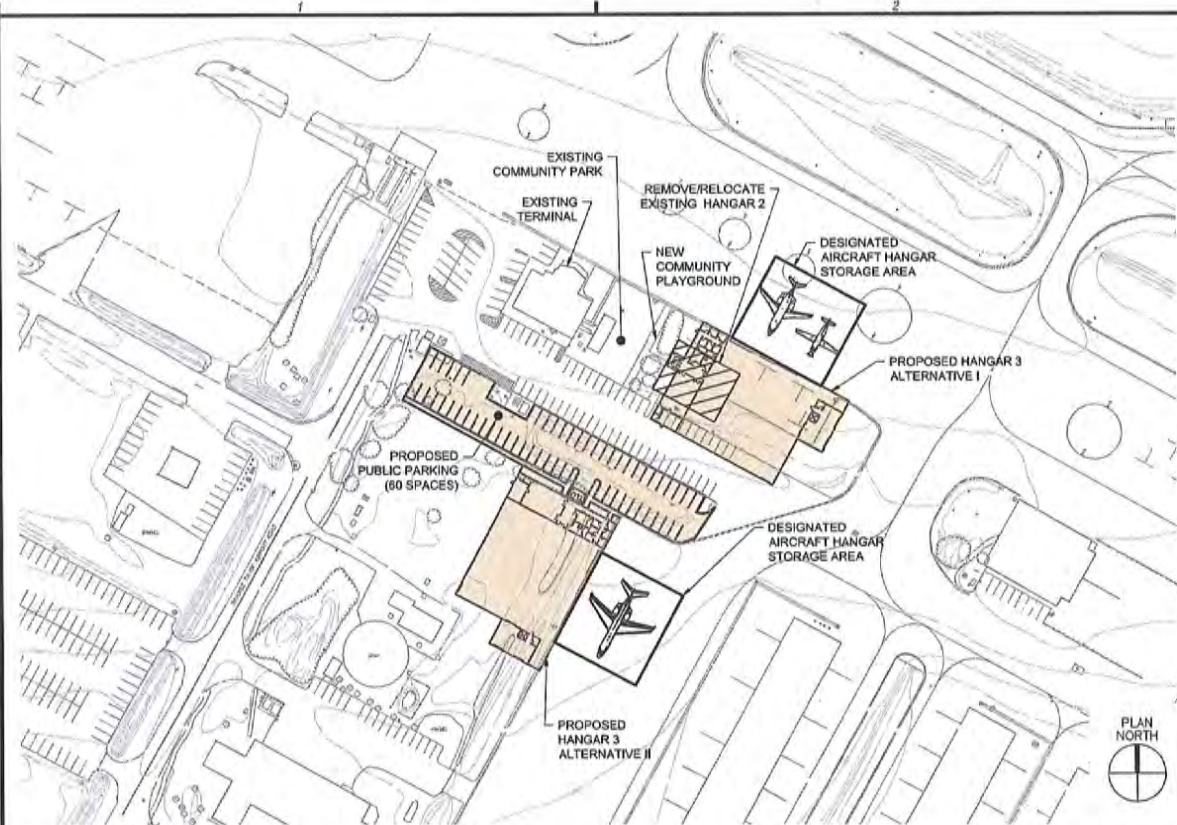
Truckee Tahoe Airport – Business Aircraft Hangar Needs Assessment

- There is currently minimal offerings for a business aircraft transient hangar within the service area
- The firm overnight historical data supports a minimum return on investment of 16.5 years
- All the calculations and assumption in this report are based on data collected and industry knowledge

Based on the existing layout of the airport and reasonable needs of the proposed facility (e.g., size, access, etc.), a preferred alternative was selected. This Alternative locates the development just south of the current ramp area, east of the existing General Aviation Terminal Building and adjacent to the current park/play area, requiring a relocation or complete demolition of Hangar 2. This new facility would consist of a total footprint area of approximately 20,000 square foot. This footprint includes the aircraft storage hangar, GSE storage area, and community center. A parking lot would be required for either location to meet local code requirements.

C&S would recommend that TTAD consider the following steps should they decide this is a viable option for the Truckee Tahoe Airport:

- Incorporate the preferred location into ongoing Master Plan Study and Airport Layout Plan
- Determine level of analysis needed for National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) compliance
- Prepare a procurement and delivery method for design and construction
- Consider financing options
- Contract consulting for preliminary engineering and planning (Part 77 review and 7460 approval)
- Evaluate Hangar 2 relocation options for placement of new Hangar 3



A1

CONCEPTUAL SITE PLAN

SCALE: 1" = 100'

0 100' 200'



C&S Engineers, Inc.
6185 Col Center Drive
Sacramento, California 95824
Phone: 916-384-1470
www.cses.com

PRELIMINARY
NOT FOR
CONSTRUCTION

**TRUCKEE TAHOE AIRPORT
HANGAR 3
NEEDS ASSESSMENT**

DATE	DATE	DESCRIPTION
10/15/2014	10/15/2014	REVISED
10/15/2014	10/15/2014	REVISED
10/15/2014	10/15/2014	REVISED
10/15/2014	10/15/2014	REVISED
10/15/2014	10/15/2014	REVISED
10/15/2014	10/15/2014	REVISED
10/15/2014	10/15/2014	REVISED
10/15/2014	10/15/2014	REVISED
10/15/2014	10/15/2014	REVISED

**CONCEPTUAL
SITE PLAN**

CS101B

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C&S Engineers, Inc.
18111 Fairway Drive
Suite 400
Bakersfield, California 93311
Phone: 805-334-1413
www.c-s-engineers.com

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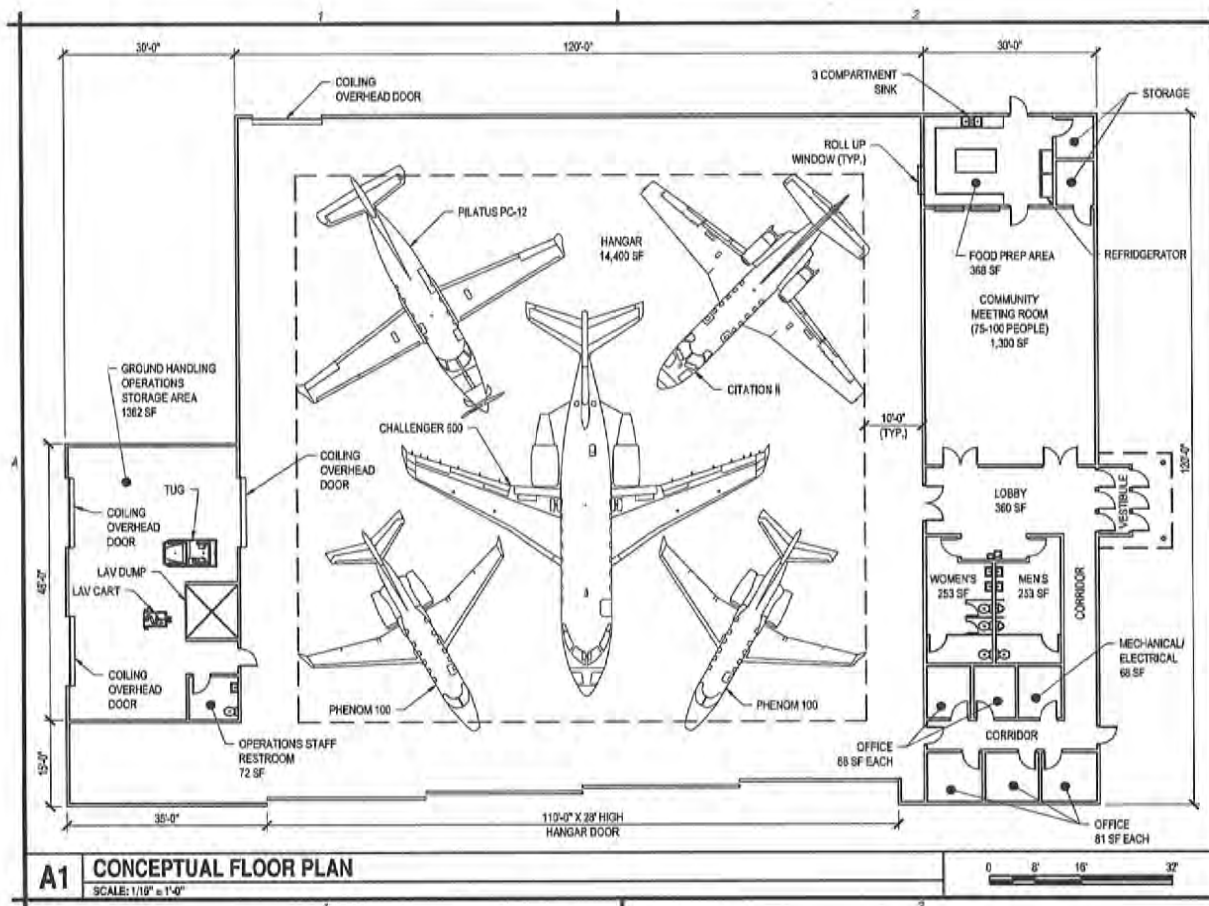
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HANGAR 3
NEEDS ASSESSMENT**

NO.	DATE	DESCRIPTION
1	1/15/2014	REVISION
2	1/15/2014	REVISION
3	1/15/2014	REVISION
4	1/15/2014	REVISION
5	1/15/2014	REVISION

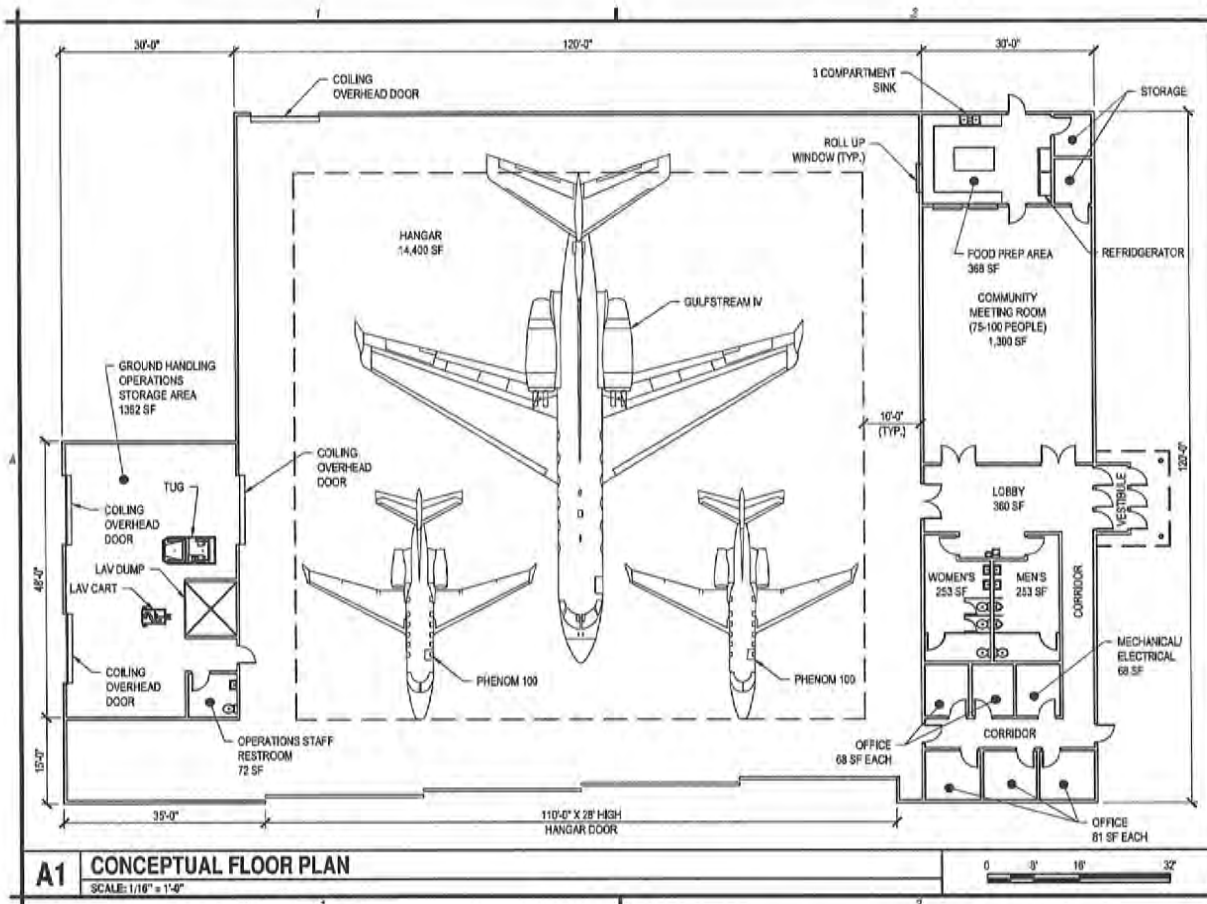
**CONCEPTUAL
FLOOR PLAN
AIRCRAFT
SCENARIO 1**

AE101

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A1 CONCEPTUAL FLOOR PLAN
SCALE: 1/16" = 1'-0"



C&S
COMPANIES

C&S Engineers, Inc.
4800 Col. Oliver Drive
Suite 400
Sacramento, California 95828
Phone: 916-358-1470
www.ccs.com

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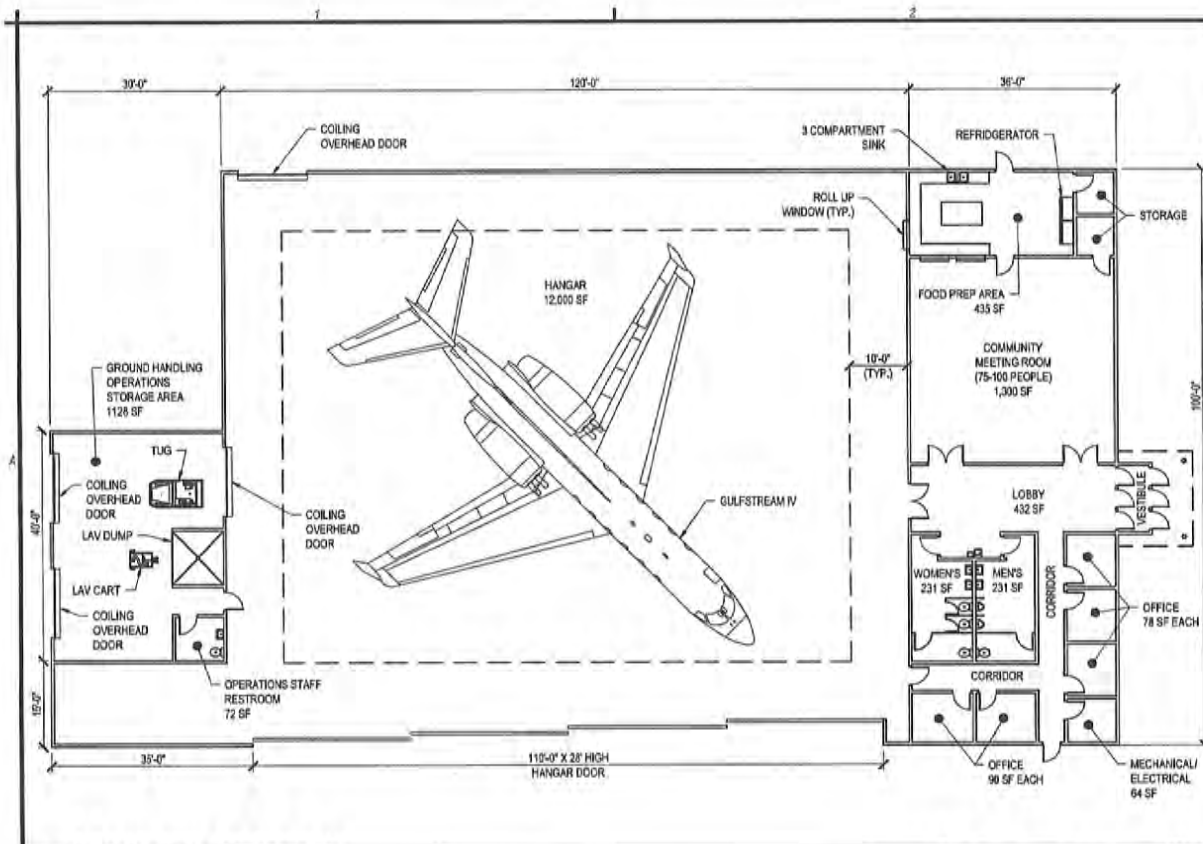
**TRUCKEE TAHOE AIRPORT
HANGAR 3
NEEDS ASSESSMENT**

DATE	DESCRIPTION
10/15/2014	REVISION
10/15/2014	DATE
10/15/2014	DATE
10/15/2014	DATE
10/15/2014	DATE

**CONCEPTUAL
FLOOR PLAN
AIRCRAFT
SCENARIO 2**

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A1 CONCEPTUAL FLOOR PLAN
SCALE: 1/16" = 1'-0"

0 5' 10' 32'



C&S Engineers, Inc.
1880 Col Center Drive
Suite 400
Sacramento, California 95825
Phone 916-364-1470
www.ccs.com

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**TRUCKEE TAHOE AIRPORT
HANGAR 3
NEEDS ASSESSMENT**

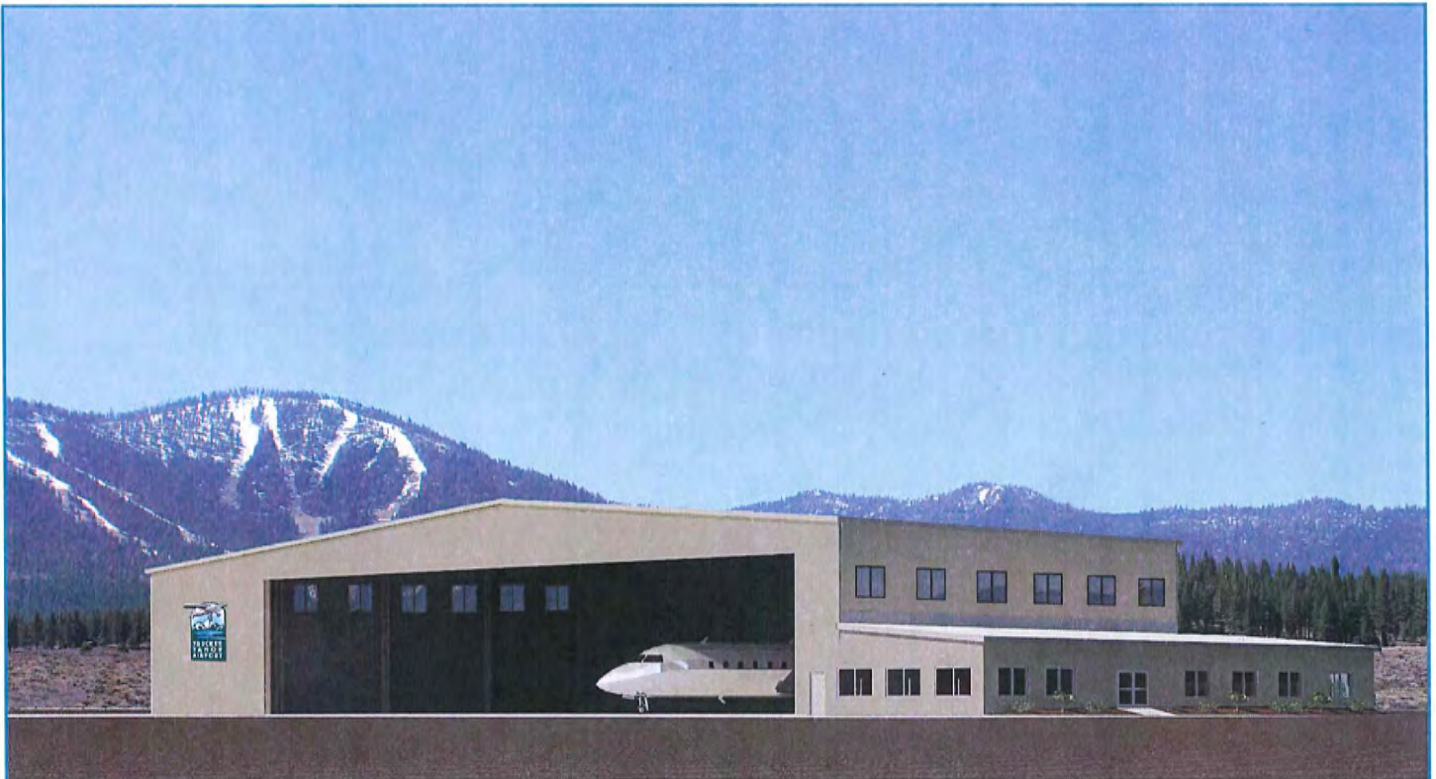
DATE	DESCRIPTION
10/14/2014	REVISED
10/14/2014	REVISED
10/14/2014	REVISED
10/14/2014	REVISED
10/14/2014	REVISED

**CONCEPTUAL
FLOOR PLAN
AIRCRAFT
SCENARIO 4**

AE104

10/14/2014 - 11/14/2014
PROJECT: TRUCKEE TAHOE AIRPORT
DESIGNER: C&S ENGINEERS, INC.
DRAWN BY: J. L. GATSON
CHECKED BY: J. L. GATSON
DESIGNED BY: J. L. GATSON
DESIGNED BY: J. L. GATSON

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Truckee Tahoe Airport Proposed Hangar 3

This conceptual rendering is for planning purposes only. A new complete architectural rendering is recommended once a consultant is selected to design the facility for Truckee Tahoe.

Rendering 1



Truckee Tahoe Airport Proposed Hangar 3

This conceptual rendering is for planning purposes only. A new complete architectural rendering is recommended once a consultant is selected to design the facility for Truckee Tahoe.

Rendering 2



ENGINEER'S OPINION OF PROBABLE PROJECT COST

TRUCKEE TAHOE AIRPORT
HANGAR AND COMMUNITY BUILDING

C&S PROJ NO: N89.CRM
SCHEMATIC DESIGN
02/05/14

ITEM NO	FAA / CALTRANS SPEC	DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	TOTAL
1		REMOVAL OF HANGAR 2	1	LS	\$30,000.00	\$30,000.00
2		HANGAR BUILDING (120'x120') WITH 110'x28' HANGAR DOOR	14,850	SF	\$135.00	\$2,004,750.00
3		MAINTENANCE BUILDING	1,440	SF	\$95.00	\$136,800.00
4		COMMUNITY BUILDING	3,600	SF	\$135.00	\$486,000.00
5		SITE WORK (NOT INCLUDING APRON IMPROVEMENTS)	1	LS	\$251,000.00	\$251,000.00
TOTAL CONSTRUCTION COST						\$2,908,550.00

PLAN CHECK AND PERMITS \$28,000

ARCHITECTURAL, ENGINEERING AND CM FEE \$319,000

TOTAL PROBABLE PROJECT COST \$3,255,550

****ASSUMED PREVAILING WAGES.

Aircraft Compatability by Hangar

AIRCRAFT/HANGAR COMPATABILITY					
TU CATEGORY	AIRCRAFT TYPE	HANGAR #A-9	HANGAR #1	HANGAR #3	Legend
2	CONQUEST 425	X	X	X	MOST COMMON
2	CARAVAN	X	X	X	FREQUENT
2	CONQUEST 441	X	X	X	LESS FREQUENT
2	CESSNA CJ 1 525	X	X	X	LESS COMMON
2	CESSNA CJ 2 525A	X	X	X	
2	CITATION JET	X	X	X	
2	CITATION	X	X	X	
2	CITATION 1 500	X	X	X	
2	CITATION MUSTANG 510	X	X	X	
2	PIPER CHEYENNE PA31T	X		X	
2	KING AIR 90	X		X	
2	KING AIR 100	X		X	
2	KING AIR 200	X	X	X	
2	LEAR 23	X	X	X	
2	MITSUBISHI MU-2B	X	X	X	
2	PIAGIO P-180	X	X	X	
2	PILATUS PC-12	X	X	X	
2	PREMIER 1A	X		X	
2	SWEARINGER MERLIN	X		X	
2	TURBINE COMMANDER	X		X	
3	BEECHJET 400	X		X	
3	CESSNA CJ3 525B	X		X	
3	CITATION BRAVO	X		X	

Aircraft Compatability by Hangar

TU CATEGORY	AIRCRAFT TYPE	HANGAR #A-9	HANGAR #1	HANGAR #3	Legend
3	CITATION ENCORE	X		X	MOST COMMON
3	CITATION II 550	X		X	FREQUENT
3	CITATION ULTRA	X		X	LESS FREQUENT
3	CITATION 5 560	X		X	LESS COMMON
3	FALCON 10	X		X	
3	HAWKER 400XP	X		X	
3	KING AIR 300	X	X	X	
3	KING AIR 350	X	X	X	
3	LEAR 24	X	X	X	
3	LEAR 25,28,29	X	X	X	
3	LEAR 31	X	X	X	
3	LEAR 35,36	X	X	X	
3	PHENOM 300			X	
3	PHENOM 350			X	
3	PREMIER II 390	X		X	
3	SABRELINER			X	
4	CITATION III 650			X	
4	CITATION EXCEL 560XL			X	
4	CITATION VI 650			X	
4	CITATION VII 680			X	
4	CITATION X 750			X	
4	CHALLENGER 300			X	
4	CHALLENGER 600			X	
4	CHALLENGER 601			X	
4	CHALLENGER 604			X	

Aircraft Compatability by Hangar

TU CATEGORY	AIRCRAFT TYPE	HANGAR #A-9	HANGAR #1	HANGAR #3	Legend
4	FALCON 20F			X	MOST COMMON
4	FALCON 50			X	FREQUENT
4	FALCON 900			X	LESS FREQUENT
4	FALCON 2000			X	LESS COMMON
4	FALCON 2000EX			X	
4	GULFSTREAM G100			X	
4	GULFSTREAM G150			X	
4	GULFSTREAM 200			X	
4	GULFSTREAM 280			X	
4	HAWKER 125			X	
4	HAWKER 125-800			X	
4	HAWKER 750			X	
4	HAWKER 800			X	
4	HAWKER 850XP, 900XP			X	
4	HAWKER 1000			X	
4	HAWKER 4000			X	
4	HAWKER HORIZON			X	
4	LEAR 40,	X	X	X	
4	LEAR 45	X	X	X	
4	LEAR 55	X	X	X	
4	LEAR 60	X	X	X	
5	WESTWIND	X		X	
5	GLOBAL EXPRESS			X	
5	GUFLSTREAM 350			X	
5	GULFSTREAM 450			X	

Aircraft Compatability by Hangar

TU CATEGORY	AIRCRAFT TYPE	HANGAR #A-9	HANGAR #1	HANGAR #3	Legend
5	GULFSTREAM 500			X	MOST COMMON
5	GULFSTREAM 550			X	FREQUENT
5	GULFSTREAM G II			X	LESS FREQUENT
5	GULFSTREAM G III			X	LESS COMMON
5	GULFSTREAM G IV			X	
5	GULFSTREAM G IV SP			X	
5	GULFSTREAM G V			X	
5	GULFSTREAM G 650			X	