TRUCKEE TAHOE AIRPORT DISTRICT
BOARD OF DIRECTORS AGENDA ITEM SUMMARY

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| Topic: | Hangar 3 – Multiuse Hangar Project Assessment Review.<br><br>Consideration of Funding Project Design and Bidding.<br><br>Appointment of Ad Hoc Committee |
| Purpose | Information: Guidance: Decision: **X** |
| Recommendation | Consider Hangar 3 Needs Assessment as presented by C&S Companies along with additional information as prepared by staff and consultants.<br><br>Consider releasing funding for design and bidding of Hangar 3 project as included in the FY2014 Budget.<br><br>Appoint two Directors to form the Hangar 3 Ad Hoc Committee |
| Last Action | The Board of Directors, along with Staff, last discussed this topic at the April 23, 2014 Board Meeting. C&S companies presented the needs assessment study and answered questions presented by the Board, staff, and the public. After substantial discussion and analysis, the Board requested that staff further analyze 3 questions. These are:<br><br>1. What is the anticipated function and use of the building related to community events and nonprofit usage? What types of events and how many people might attend.<br>2. Provide additional detail regarding return on investment, revenue, and expenses. Additional information related to long-term capital improvement costs, utilities, and operational expenses should be incorporated into the ROI.<br>3. Community and traffic impacts and potential for additional operations as a result of constructing and operating the facility on the airport. |
| Discussion | Subsequent to the March 26, 2014 Board Meeting, staff divided responsibilities and sought additional consulting assistance to answer these questions. Included in this staff report are three sub-reports as prepared by staff. Staff also sought the assistance of Mead and Hunt, to describe and verify how Hangar 3 and other future hangar development, as proposed in the Master Plan, were considered in the Aviation Forecast Chapter which they recently completed. Their Professional Opinion Summary is attached to this report.<br><br>Please review the attached sub reports as provided. These are:<br><br>1. Anticipated Future Community Usage - Mike Barrett and Hardy Bullock<br>2. ROI and Financial Summary Report - Jane Dykstra |

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| | 3. Potential Future Traffic Impacts - Hardy Bullock<br><br>These staff members will make a brief presentation at the meeting, outlining their findings and answer any questions the Board may have related to their analysis.<br><br>Staff will also note that if the Board decides to move forward with this project, staff will 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.<br><br>In addition, staff recommends appointing an Ad Hoc Committee to assist staff in oversight and steering of the project. |
| Fiscal Impact | The Board budgeted $375,000 in the FY 2014 budget for design and bidding of a multipurpose community hangar. In addition, approximately $15,000 has been expended on the Needs Assessment process. If approved, staff will use the budgeted 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 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.<br><br>Regarding the design process, staff will work 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 – C&S Companies<br>• Existing & Future Hangar Resource Chart by Aircraft Type<br>• Mead & Hunt - Hangar 3 Traffic Analysis<br>• Sub Report - Anticipated Future Community Usage - Mike Barrett and Hardy Bullock<br>• Sub Report - ROI and Financial Summary Report - Jane Dykstra<br>• Sub Report - Potential Future Traffic Impacts - Hardy Bullock |

# Truckee Tahoe Airport
# Hangar 3
# Draft Needs Assessment

## February 2014

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# 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:

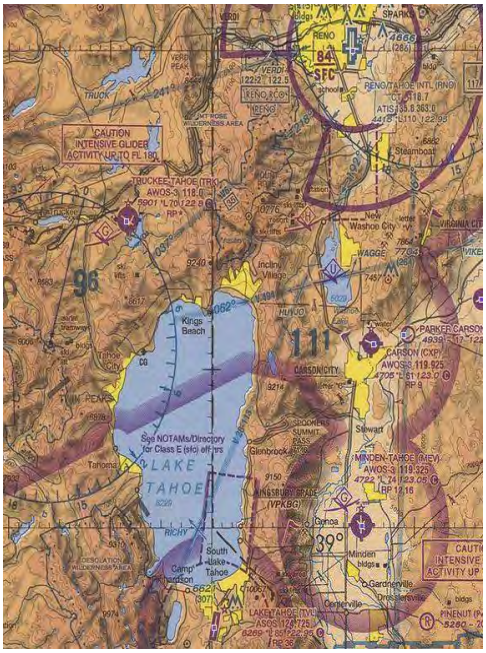
- 3,036 total operations by turboprop aircraft
- 1,046 total operations by business jet aircraft weighing less than 12,499 pounds
- 946 total operations by business jet aircraft weighing between 12,500 and 19,999 pounds
- 974 total operations by business jet aircraft weighing more than 20,000 pounds

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.

**Airport Service Area - Sectional Chart**




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.

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**

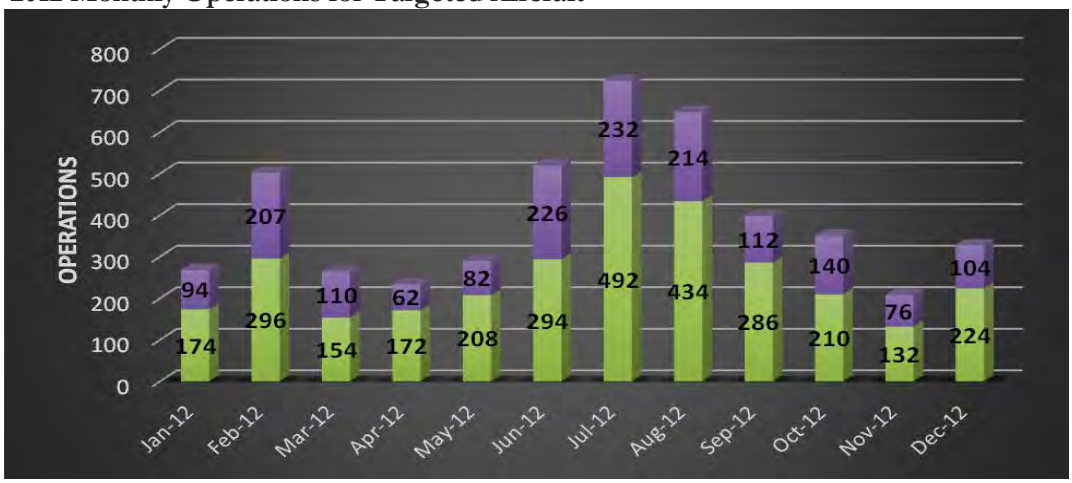



***Image and data provided from current Master plan update***

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 for TD2, TD3, and.

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 * |
|---|---|---|---|---|---|---|
| CITATIONSHARES 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 | |
| | | | | | | Potential Hgr3 Total Annual Revenue |
| REDUCE 50% TO DEMONSTRATE CONSERVATIVE ABSORBTION | 120 | 61 | 97.5 | 23 | 41.5 | |
| 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 |
| REDUCE 60% TO DEMONSTRATE 50% CONS. ABSORB +10% Saturation | 96 | 48.8 | 39* | 9.2* | 16.6 | |
| 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 |
| *TD4, & TD5 reflect larger aircraft therefore this was reduced to 80% | | | | | | |
| ** 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:

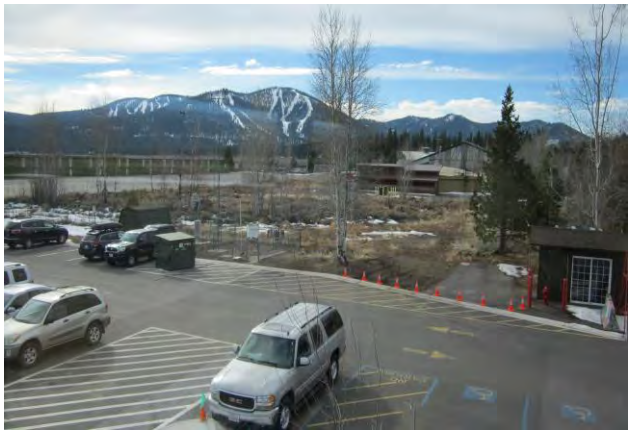
- Hangar 2 would need to be relocated and/or demolished before the new hangar building could be constructed.
- There would be a loss of 11 existing vehicle parking stalls in the new footprint.

- 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 taxilane 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 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** |

**** 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.***

# 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 15 years** | -$984,000.00 |
| **Total Potential Investment Cost** | -$4,269,550.00 |
| *** ROI Method I (Based on 1.7 target aircraft visits a day/365)** | $317,075.50 |
| **Year estimation of ROI** | **13.5 years** |
| **** ROI Method II (Based on historical overnight information section 3)** | $183,625.00 |
| **Year estimation of ROI** | **23 years** |
| **** ROI Method III (Based on historical overnight information Section 3)** | $101,978.00 |
| **Year estimation of ROI** | **42 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. Considered in Method II the 50% reduction and Method III the 60% reduction in TD2 & TD3 with an 80% reduction for TD 4 & 5.***

| 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 15 years** | -$873,000.00 |
| **Total Potential Investment Cost** | -$3,437,750.00 |
| *** ROI Method I (Based on 1.7 target aircraft visits a day/365)** | $317,075.50 |
| **Year estimation of ROI** | **11 years** |
| **** ROI Method II (Based on historical overnight information section 3)** | $183,625.00 |
| **Year estimation of ROI** | **19 years** |
| **** ROI Method III (Based on historical overnight information Section 3)** | $101,978.00 |
| **Year estimation of ROI** | **34 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. Considered in Method II the 50% reduction and Method III the 60% reduction in TD2 & TD3 with an 80% reduction for TD 4 & 5.***

# 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:

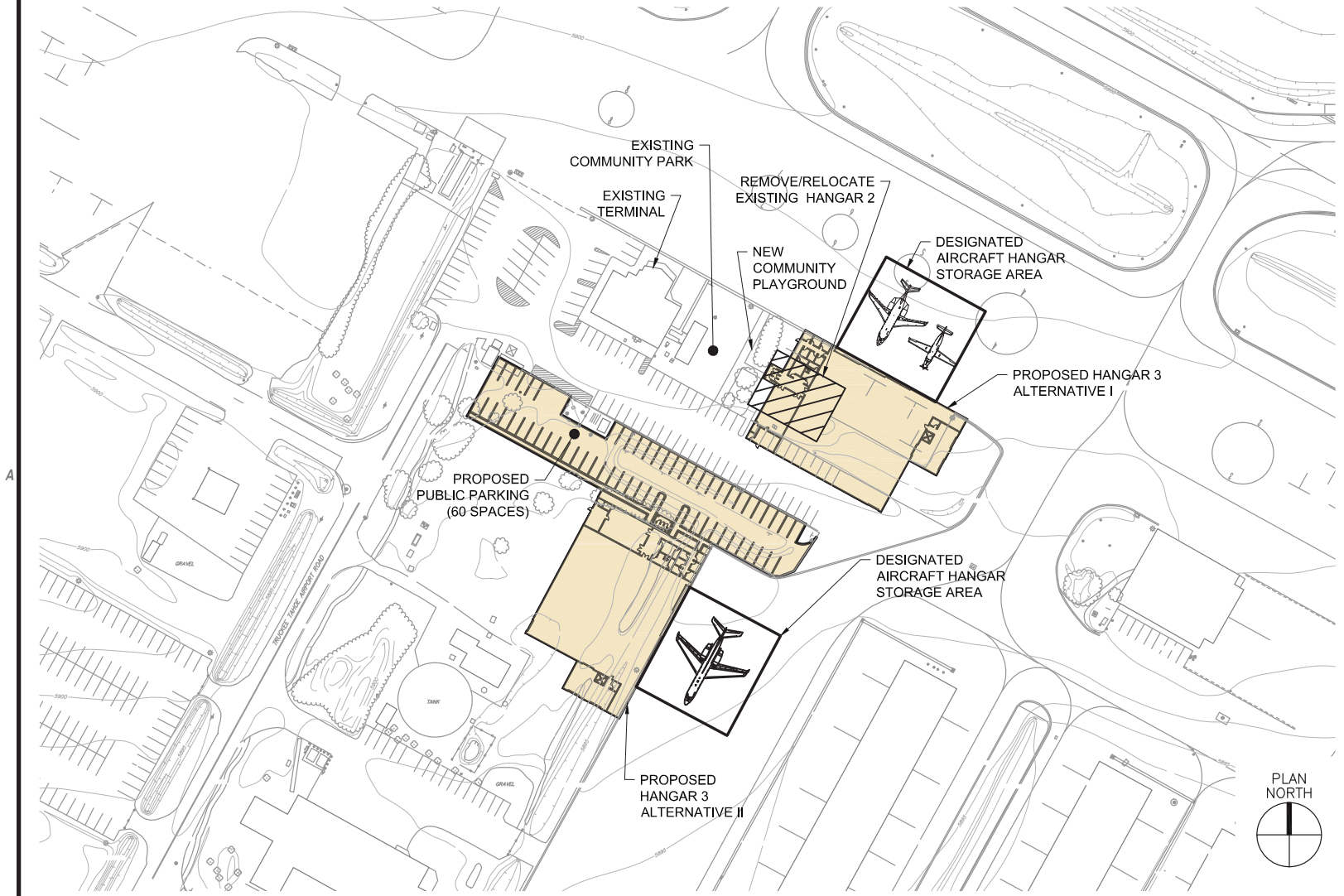
- The airport has seen an increase in operations in recent years
- TTAD and C&S have verified with fractional providers that it is more feasible at times to overnight park inside a hangar rather than to reposition for the customers
- The service area is for hangar offerings is considered a low threat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

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C&S Engineers, Inc.
8880 Cal Center Drive
Suite 400
Sacramento, California 95826
Phone: 916-364-1470
www.cscos.com

PRELIMINARY
NOT FOR CONSTRUCTION

TRUCKEE TAHOE AIRPORT
HANGAR 3
NEEDS ASSESSMENT

| MARK | DATE | DESCRIPTION |
|---|---|---|
| REVISIONS | | |

| | |
|---|---|
| PROJECT NO: | N89.001.001 |
| DATE: | JANUARY 2014 |
| DRAWN BY: | K.M. WATSON |
| DESIGNED BY: | R.M. ROTH |
| CHECKED BY: | |

CONCEPTUAL SITE PLAN

CS101B

Feb 05, 2014 – 11:37am
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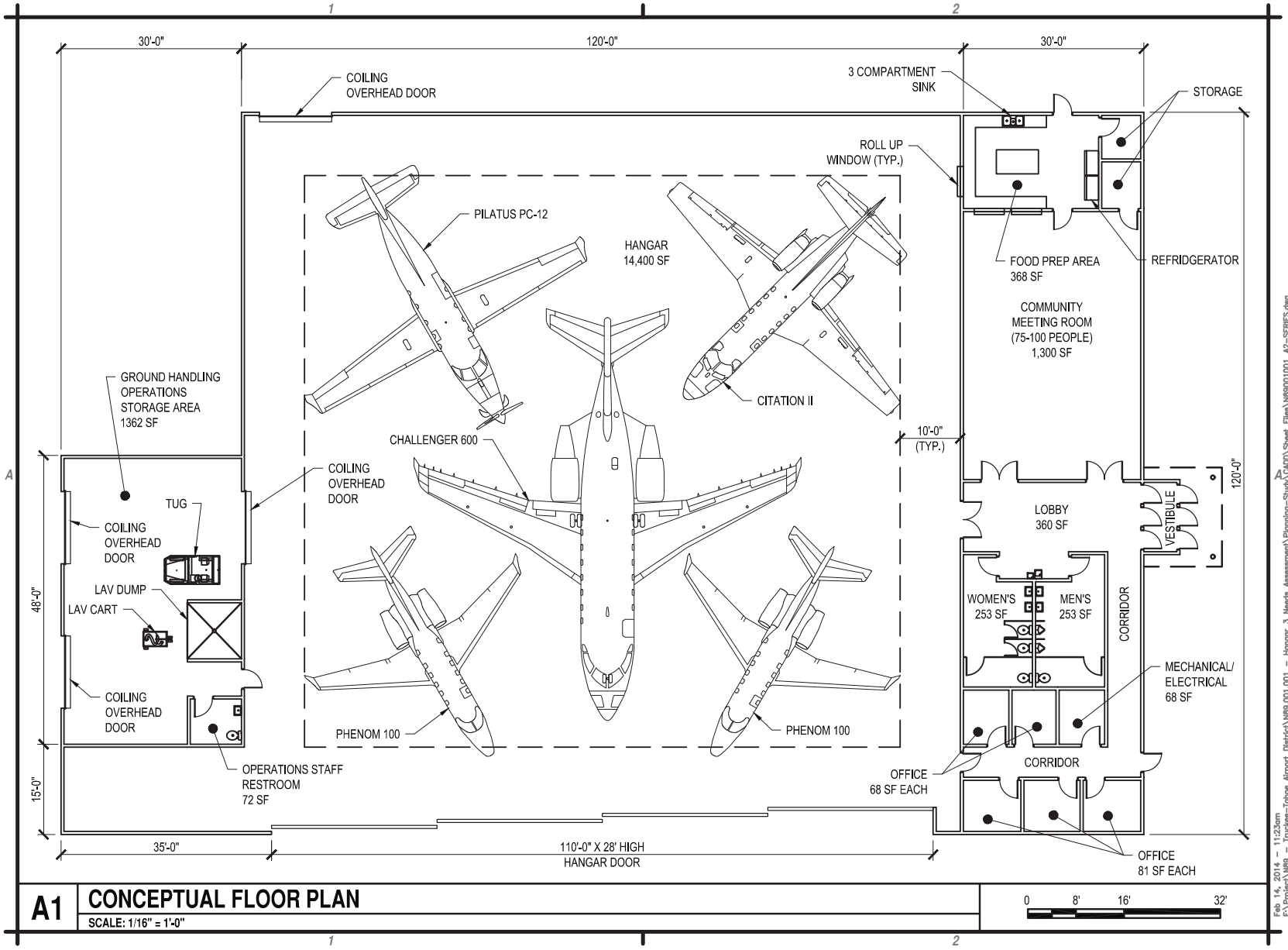


**A1** CONCEPTUAL FLOOR PLAN

SCALE: 1/16" = 1'-0"

0 8' 16' 32'


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TRUCKEE TAHOE AIRPORT
HANGAR 3
NEEDS ASSESSMENT

| MARK | DATE | DESCRIPTION |
|---|---|---|
| REVISIONS | | |

| | |
|---|---|
| PROJECT NO: | N89.001.001 |
| DATE: | JANUARY 2014 |
| DRAWN BY: | K.M. WATSON |
| DESIGNED BY: | R.M. ROTH |
| CHECKED BY: | |

CONCEPTUAL FLOOR PLAN AIRCRAFT SCENARIO 1

AE101

Feb 14, 2014 – 11:23am
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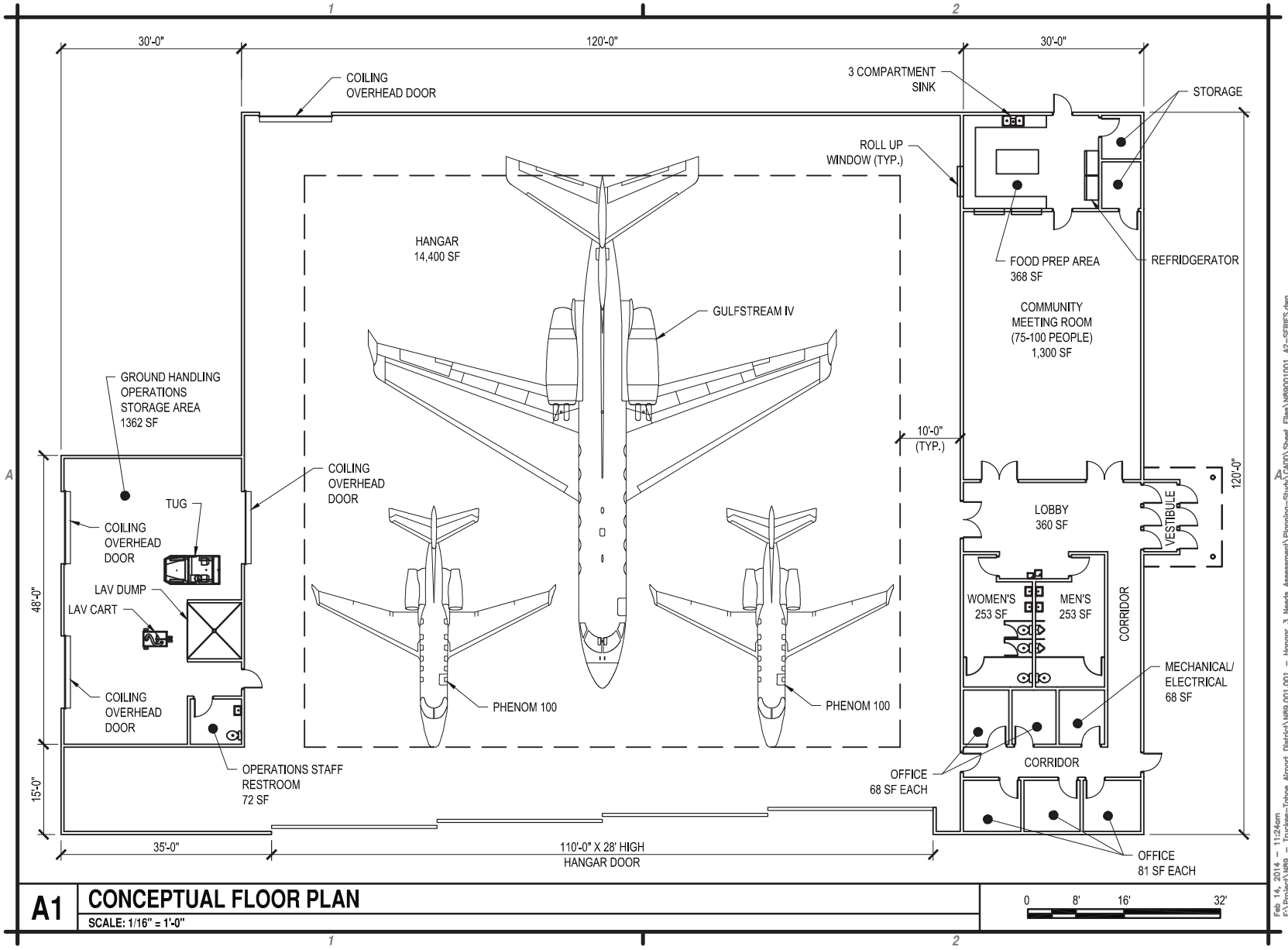


**A1** CONCEPTUAL FLOOR PLAN

SCALE: 1/16" = 1'-0"

0 8' 16' 32'

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Sacramento, California 95826
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TRUCKEE TAHOE AIRPORT
HANGAR 3
NEEDS ASSESSMENT

| MARK | DATE | DESCRIPTION |
|---|---|---|
| REVISIONS | | |

| | |
|---|---|
| PROJECT NO: | N89.001.001 |
| DATE: | JANUARY 2014 |
| DRAWN BY: | K.M. WATSON |
| DESIGNED BY: | R.M. ROTH |
| CHECKED BY: | |

CONCEPTUAL FLOOR PLAN AIRCRAFT SCENARIO 2

AE102

Feb 14, 2014 – 11:24am
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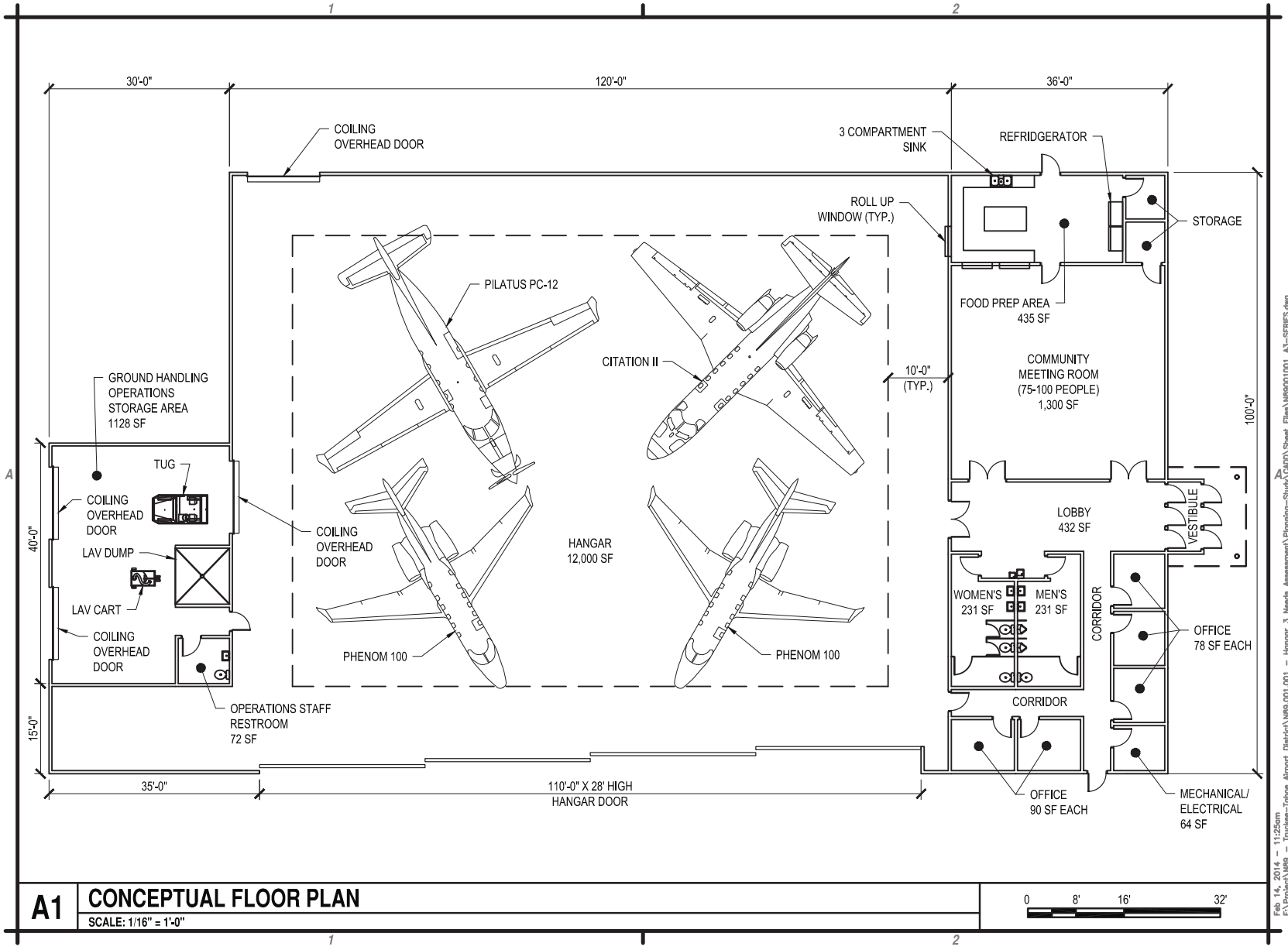


**A1** CONCEPTUAL FLOOR PLAN

SCALE: 1/16" = 1'-0"

0 8' 16' 32'


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TRUCKEE TAHOE AIRPORT
HANGAR 3
NEEDS ASSESSMENT

| MARK | DATE | DESCRIPTION |
|---|---|---|
| REVISIONS | | |

| | |
|---|---|
| PROJECT NO: | N89.001.001 |
| DATE: | JANUARY 2014 |
| DRAWN BY: | K.M. WATSON |
| DESIGNED BY: | R.M. ROTH |
| CHECKED BY: | |

CONCEPTUAL FLOOR PLAN AIRCRAFT SCENARIO 3

AE103

Feb 14, 2014 – 11:25am
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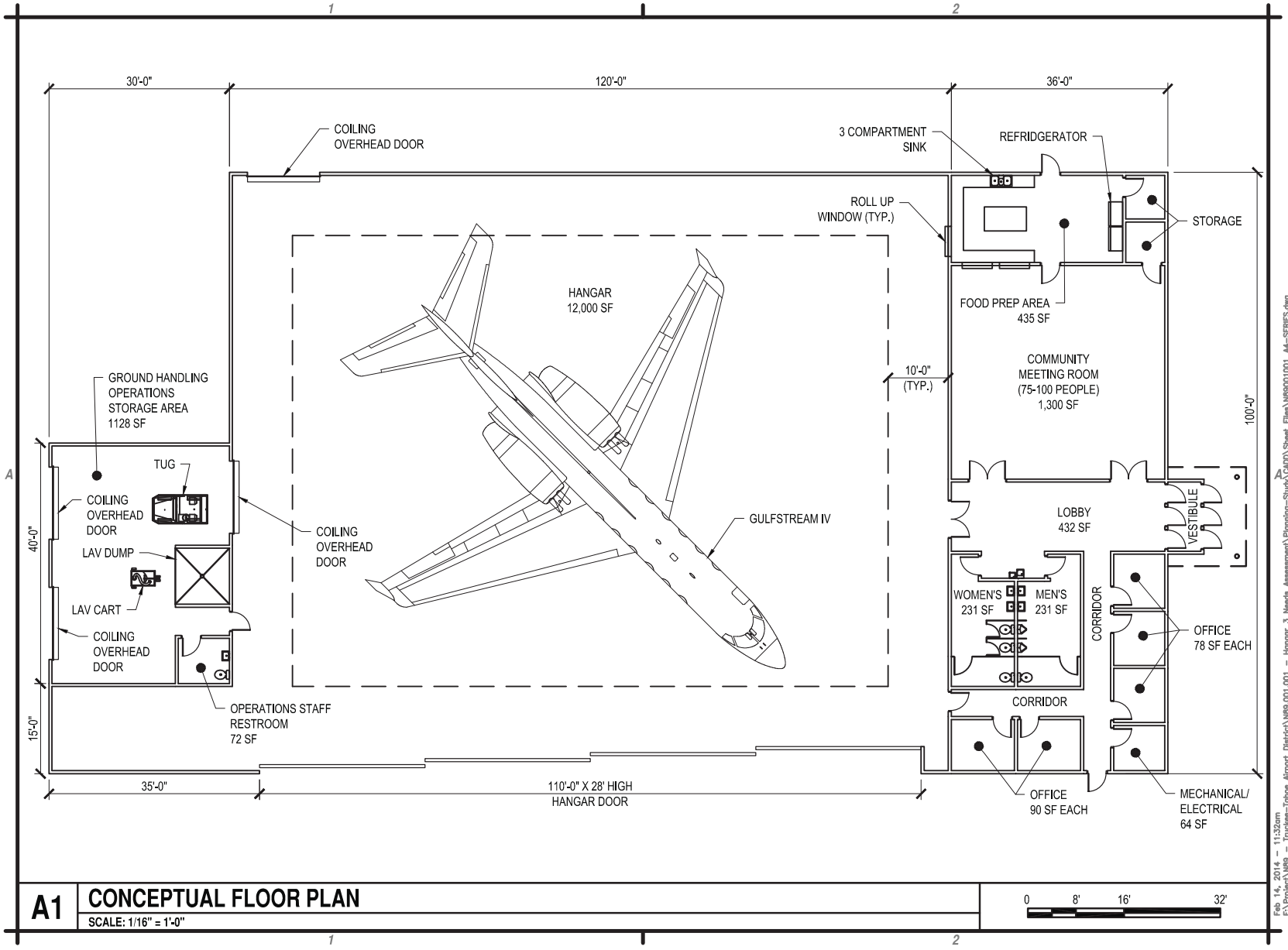


**A1** CONCEPTUAL FLOOR PLAN

SCALE: 1/16" = 1'-0"

0 8' 16' 32'


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TRUCKEE TAHOE AIRPORT
HANGAR 3
NEEDS ASSESSMENT

| MARK | DATE | DESCRIPTION |
|---|---|---|
| REVISIONS | | |

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|---|---|
| PROJECT NO: | N89.001.001 |
| DATE: | JANUARY 2014 |
| DRAWN BY: | K.M. WATSON |
| DESIGNED BY: | R.M. ROTH |
| CHECKED BY: | |

CONCEPTUAL FLOOR PLAN AIRCRAFT SCENARIO 4

AE104

Feb 14, 2014 – 11:32am
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TRUCKEE TAHOE AIRPORT

# 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

# 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.

ENGINEERS OPINION OF PROBABLE PROJECT COST

TRUCKEE TAHOE AIRPORT
TAXILANE IMPROVEMENT AND STAGING APRON

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

| ITEM NO | FAA / CALTRANS SPEC | DESCRIPTION | QUANTITY | UNITS | UNIT PRICE | TOTAL |
|---|---|---|---|---|---|---|
| 1 | P-120 | COLD MILLING EXISTING PAVEMENT | 6300 | SY | $6.00 | $37,800.00 |
| 2 | P-152 | UNCLASSIFIED EXCAVATION | 3,200 | CY | $25.00 | $80,000.00 |
| 3 | P-156 | COMPLIANCE W/POLLUTION, EROSION & SILTATION CONTROL | 1 | LS | $20,000.00 | $20,000.00 |
| 4 | CAL 26 | CRUSHED AGGREGATE BASE COURSE | 1,900 | CY | $35.00 | $66,500.00 |
| 5 | CAL 39 | ASPHALT SURFACE COURSE (2" THICK) | 1,900 | TON | $85.00 | $161,500.00 |
| | P-501 | CONCRETE PAVEMENT | 1,300 | SY | $55.00 | $71,500.00 |
| 6 | P-620 | PAINTING | 1 | LS | $10,000.00 | $10,000.00 |
| 7 | M-100 | MAINTENANCE AND PROTECTION OF TRAFFIC | 1 | LS | $20,000.00 | $20,000.00 |
| 8 | M-150 | PROJECT SURVEY & STAKEOUT | 1 | LS | $10,000.00 | $10,000.00 |
| 9 | M-200 | MOBILIZATION | 1 | LS | $15,000.00 | $15,000.00 |
| | | **TOTAL CONSTRUCTION COST** | | | | **$492,000.00** |

# 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 |
|---|---|---|---|---|
| 3 | CITATION ENCORE | X | | X |
| 3 | CITATION II 550 | X | | X |
| 3 | CITATION ULTRA | X | | X |
| 3 | CITATION 5 560 | X | | X |
| 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 |

| Legend |
|---|
| MOST COMMON |
| FREQUENT |
| LESS FREQUENT |
| LESS COMMON |

3/24/2014

# Aircraft Compatability by Hangar

| TU CATEGORY | AIRCRAFT TYPE | HANGAR #A-9 | HANGAR #1 | HANGAR #3 |
|---|---|---|---|---|
| 4 | FALCON 20F | | | X |
| 4 | FALCON 50 | | | X |
| 4 | FALCON 900 | | | X |
| 4 | FALCON 2000 | | | X |
| 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 |

| Legend |
|---|
| MOST COMMON |
| FREQUENT |
| LESS FREQUENT |
| LESS COMMON |

3/24/2014

# Aircraft Compatability by Hangar

| TU CATEGORY | AIRCRAFT TYPE | HANGAR #A-9 | HANGAR #1 | HANGAR #3 |
|---|---|---|---|---|
| 5 | GULFSTREAM 500 | | | X |
| 5 | GULFSTREAM 550 | | | X |
| 5 | GULFSTREAM G II | | | X |
| 5 | GULFSTREAM G III | | | X |
| 5 | GULFSTREAM G IV | | | X |
| 5 | GULFSTREAM G IV SP | | | X |
| 5 | GULFSTREAM G V | | | X |
| 5 | GULFSTREAM G 650 | | | X |

| Legend |
|---|
| MOST COMMON |
| FREQUENT |
| LESS FREQUENT |
| LESS COMMON |

DESTINATION 2025
TRUCKEE TAHOE AIRPORT
A MASTER PLAN PILOTED BY THE COMMUNITY








# M E M O R A N D U M

| | |
|---|---|
| TO: | TTAD Board |
| FROM: | Bradley Musinski, Project Manager |
| DATE: | April 16, 2014 |
| SUBJECT: | Hangar 3 Traffic Analysis |
| PROJECT No. | 2013700-114396 |

## Background

The Truckee-Tahoe Airport District (TTAD) is considering constructing a joint-use common storage hangar at the Truckee-Tahoe Airport (TRK). The primary benefits anticipated include: supporting airport customers by providing an additional service, providing district communities with a large heated enclosure to support community services and events, enabling a non-chemical means for removing/preventing snow and ice accumulation (e.g., overnight or short-term durations).

In addition to the primary benefits described above, there are rationale to support that the hangar will help reduce the number of relocation flights. Relocation flights are most typically conducted by fractionally or corporately owned business aircraft types (turbo-jets and turbo-props). The practice involves dropping passengers off at TRK, repositioning the aircraft to another airport for overnight storage, and returning to pick up the passengers. There is also concern about the creation of additional large-aircraft demand at TRK due the presence of a new hangar/thaw facility. The TTAD is also assessing return on investment (ROI) associated with the construction and operation of the new facility.

The analysis presented by Mead & Hunt in this memorandum focuses on the potential for the new hangar facility to increase large aircraft operational demand at TRK. Mead & Hunt is currently contracted by the TTAD to conduct an airport master plan, which is estimated to be draft complete in May 2014. Included in this memo is a discussion concerning the aviation demand forecasts: Chapter 2 of the master plan – Aviation Forecasts (February 2014). Mead & Hunt also reviewed “Truckee Tahoe Airport Hangar 3 Needs Assessment” (February 2014, C&S Engineers, Inc.).

## Analysis

This section provides information and assessment of the primary factors influencing demand and how the new hangar facility would be expected to alter airport activity.

### Primary Influences of Aviation Operational Activity at TRK

Chapter 2 (Aviation Forecasts) of the draft Airport Master Plan report provides a detailed description of the factors influencing aviation demand. From a broad perspective, the types of aircraft using the airport are

TRUCKEE TAHOE AIRPORT

Mead & Hunt

affected by changes occurring within the entire U.S. fleet. Generally, light piston-engine airplanes make up a significant, but declining share of the nationwide fleet of aircraft. Business jets, turbo-props, and helicopters are increasing in terms of both the total number of aircraft and as a percentage of the fleet. Business jets and turbo-props also have a much higher utilization rate compared to light piston airplanes (i.e., they fly more hours per year). The basic trends are not influenced by the hangar facility.

Another important factor is the regional setting. The Lake Tahoe area is described as a “destination” market. Travel to the area, regardless of mode, is influenced by the desirability of the mountain setting, which includes significant peaks and troughs. For the most part, these influences are beyond the airport’s control. The forecast chapter notes that activity fluctuations may reduce slowly over time as a result of technology enhancements and local economic initiatives to lure permanent jobs to the area. The presence of TRK supports these local initiatives and can be a factor in a business’s decision to locate in the Truckee area. It is important to note that the airport activity is driven by local growth. For example, the development of a new conference center or large entertainment venue would be likely to generate additional aviation activity at TRK.

Airport facilities are the third level of influence of aviation activity. The runway/taxiway system and services available are currently capable of supporting activity by large business jets and turbo-prop aircraft with few constraints. In fact, the current master plan recommends fewer demand-driven facilities than the older one being replaced. The primary constraints can be grouped as follows:

- Communications, surveillance, and weather reporting support— These issues documented in the master plan most directly impact operational delays, not total activity. Improvements would reduce the amount of time to arrive into or depart from the airport.
- Executive Hangars— There is a waiting list for box-type executive hangars. These hangars are used for permanent and seasonal storage of aircraft. Although some of the aircraft owners on the waiting list would be new to TRK, the overall effect of executive hangar construction on total operations is expected to be minimal.
- All-weather operational support facilities and services— the airport is difficult to access during poor weather. Consistent with community input, the master plan does not recommend upgrades that would support continuous operation during these conditions. The plan has been updated to remove improvements to lighting and instrument approach procedures that would be supportive of operations during stormy or poor visibility conditions.

Typically, such new hangars are provided by an airport's FBO or other private investors as a commercial revenue generating facility serving a variety of functions. As such, the hangar's use for aircraft overnight storage and/or deicing is but one of many potential uses and benefits accruing to the FBO, the airport, and the customer. The nature and volume of an airport's air traffic would not be expected to change solely as a result of such a hangar being available. In this particular application (i.e., aircraft deicing), it can be anticipated that the availability of such a hangar could result in slightly less air traffic since a transient aircraft might prefer to make one visit to the airport and deice in the hangar versus making two flights to reposition at an alternate airport with deicing capability.

In our professional opinion, the new short-term/ overnight hangar would not attract new demand by itself. The operational appeal of the airport, particularly for larger aircraft carrying recreational visitors, residents, and people on business, is in the area itself. As noted in the Needs Assessment report, a business aircraft operator will use the nearest facility to the desired destination with a primary purpose of minimizing driving

time. These operators will incur additional costs to do so: drop-off and return. The new hangar would certainly be used by the large transient operators (some require hangar storage for overnight parking), but it would be an enhancement to an existing operation. Aircraft with visitors bound for Reno, South Lake, Carson City, and Minden would not use TRK for passenger drop-off due to driving distances. It is also unlikely for TRK to be used for relocation with the new hangar in place because similar facilities are being planned, constructed or expanded at those locations; some also have better all-weather capability. The limited size of the hangar facility combined with a shared peaking calendar reduces the potential for relocation operations. Finally, with the historic knowledge gained through several seasons, TRK may also adjust fees to optimize the hangars operational footprint on the community in terms of benefits/impacts.

Relationship to Master Plan Forecasts of Aviation Activity

Chapter 2 of the draft Airport Master Plan presents a detailed projection of activity through calendar year 2025 along with the rationale used in developing those projections. The projections were developed using common methodologies accepted by the Federal Aviation Administration (FAA) for purposes of developing a master plan. A key part of the FAA's model is to develop forecasts that are reflective of the demand if all of the necessary facilities were in place. It is essentially an unconstrained, or "natural" forecast. The FAA model also permits localities to include limitations on an airport's role when assessing future activity. The forecasts assume that TRK will serve the same role that it has today. Most specifically: growth at the airport activity will reflect the overall growth experienced within the community, nationwide trends impacting the aircraft fleet are addressed, and there will be no design enhancements intended to increase all-weather or nighttime activity.

The draft forecasts assume that the hangars needed to satisfy the existing waiting list would be constructed and that additional hangars would be developed as additional demand warrants. The forecasts utilized growth rate projections for estimating when those facilities might be warranted. The joint-use hangar (now being called Hangar 3) was not a factor in determining based aircraft because it was assumed it would only support on-demand transient operations. The impact to operational projections was also minor since the hangar is expected to serve those operations occurring today; the minor difference being the elimination of some of the relocation flights. Therefore, constructing the hangar would not motivate activity to go beyond those included in the forecasts. In fact, based on the methodology used, the transient activity projections would increase slightly if the hangar is not built because of aircraft repositioning.

## Conclusions

The forecasts developed for the Airport Master Plan assumed that all hangars will be developed as demand warrants. For this reason, the construction of the hangar will not cause the forecasts to be exceeded. By employing the methodology used in developing those forecasts, removing the hangar from the plan would result in a slight upward adjustment in transient activity. This is because we assumed that the hangar would reduce the number of repositioning (i.e., dropoff/pickup) flights. The availability of a new hangar, specifically one that can be used for the occasional overnight storage and/or deicing of transient aircraft, can be expected to generate a few new operations at the airport. However, these few new operations will likely be more than balanced by an anticipated reduction in repositioning flights by transient aircraft operators. The size of the hangar combined with peaking characteristics that also affect nearby airports as well as plans to develop overnight hangars at those airports makes it unlikely that potential "lured" demand or even repositioning flights to TRK will increase activity beyond that which is included in the forecasts.

# MEMO:

**To:** **Board of Directors, ACAT and Staff**
**From:** **Mike Barrett, Safety Coordinator**
**Subject:** **Estimation of Hangar 3 Community Use**
**Date:** **April 21, 2014**

**Staff's Estimation of Community Use of Hangar 3**

Usage of Airport facilities is wide and varied. Staff very much supports utilization of Airport resources, meeting rooms, and facilities for nonprofit and public use. It is staff's opinion that the District will likely see the following:

1. Staff expects approximately 6 events in the physical hangar space per year that exceed 100 participants. Staff also expects approximately 6 events that would have less than 75 participants and could use the community room. It is unlikely that any event will exceed 400-600 participants. TDRPD indicated that they only know of 2 indoor annual community events that have 300 to 400 participants. (Bingo and the Crab Feed)

2. It's likely that the District will see approximately 1 meeting per week in the community room. A few groups that have been displaced will likely come back and use the facility. They either were not a good fit or outgrew our current facility. The highest demand for the community rooms is in the early morning and early evening. Having another community room would help to provide another option during those peak times.

3. Groups like the Civil Air Patrol will move from their existing end pocket office and use the Community Room biweekly along with permanent occupancy of one office. This would be a great improvement compared to their current facility which is not compliant with current building codes.

4. We may find the community space in Hangar 3 is more conducive to events like Good Morning Truckee, Soroptishop, and other events due to the proposed serving area. A serving area would provide a suitable area to hold and serve food safely.

5. Emergency management agencies will hold a minimum of two trainings per year in the facility. The Airport and our proximity to Station # 96 and The Truckee Police have proven to be an excellent venue for Emergency Management Training Exercises. Hangar 3 would provide even more opportunities for such cooperative training in the future.

6. We currently average almost 1 meeting per day in the community rooms. The Hangar 3 community space would decrease demand on the Board Meeting Room. Because of the technology in that room, it is difficult and cumbersome to facilitate meetings for groups who require the space but not necessarily the technology.

In the first six months of 2013 Hangar 1 was used for nine community events. The events ranged in size from 20 guests to 600 guests. Hangar 1 was not used for community events after 7/1/2013.

- Civil Air Patrol - Mission to Mars (20 guests)
- Santa Fly In (600 guests)
- Aviation Safety Seminar (100 guests)
- Alder Creek Middle School Graduation Dance (220 guests)
- Civilian Specialist Training (70 guests)
- Appetizers for the Arts (300 guests)
- Kidzone – Wizards Lab (600 guests)
- Big Brothers Big Sisters – Pilot Benefit (35 guests)
- Air Fair Dinner (250 guests)

In 2013 the Airport community rooms were used for 344 meeting by 64 different nonprofit groups. Community Room A can accommodate 64 people; Community Room B can accommodate 37 people. Total occupancy for both rooms is 101 people. 81 meetings were held combining rooms A and B to accommodate groups of 67 people or larger.

In Q1 of 2014 our meeting usage for the Community Rooms increased 13% from 93 to 105 meetings.
All of the groups that currently use the Airport for their events are interested in returning. At this time we have three events scheduled in May and we will be using a combination of A-9 and the Administration Building to accommodate these events. All of the events held in Hangar A-9 and in the lobby of the Administration Building would be held in Hangar 3.

Staff is confident in its abilities and looks forward to the challenge of facilitating meetings, events, and other Hangar 3 community usage along with the aviation demand with the staffing increase proposed in the study.

# TRUCKEE TAHOE AIRPORT DISTRICT
# INTEROFFICE MEMORANDUM

**TO:** **KEVIN SMITH**

**FROM:** JANE DYKSTRA

**SUBJECT:** HANGAR #3 ROI ANALYSIS

**DATE:** APRIL 16, 2014

**CC:**

I have calculated the Net Present Value, Internal Rate of Return and Discounted Payback Period for the Multipurpose Hangar – both the larger and smaller versions. The calculations were further broken down to show the results with and without the community space. The assumptions used in the calculations had the following sources:

**Cost of facility** – From C&S needs analysis
**Discount Rate -** Consistent with prior analyses, I have used the average of the LAIF rate over the last ten years. That average is currently 2.04%.
**Revenues from hangar rental** – Two different revenue expectations were used: the 50% reduced take rate ($183,625/year) and the 60% reduced take rate ($101,978/year) which were detailed on page 5 of the C&S Needs Analysis. For the smaller-sized hangar, the revenues used were 67% of those amounts.
**Additional revenues –** The increase in District revenues related to the rental of one end-pocket (representing the space currently occupied by Civil Air Patrol) and the rental of hangar A09 (which would no longer be needed for overnight) were taken from the hangar records. This amount was reduced by the amount the District earned from A09 overnights in the prior fiscal year (per the point of sale system). On the calculations that included the community area the revenues were increased by $3,000 for the anticipated rental charges.
**Operating expenses –** The recurring operating expenses detailed by C&S in their report were modified to use the estimated insurance costs I obtained from our broker and the building maintenance costs were modified using detail provided by Peter Beaupre. Peter scheduled recurring and non-recurring maintenance expenses for the 40 year life of the building. The recurring amounts he developed were used in the operating expense calculation, and the non-recurring expenses were pulled out and detailed

separately. The community room expenses were isolated so that they could be eliminated in the calculations that excluded that area. To obtain expenses for the smaller building, a factor of 80% was used on the additional expenses developed by Peter and a factor of 67% was applied to the utility and cleaning expenses provided by C&S.

Note that neither revenues nor expenses were shown to escalate for CPI/COLA factors during the period. The lack of any inflation factor is assumed to be offsetting.

The results of the analysis are shown in a series of tables below. In evaluating the information, remember the following:

Net Present Value (NPV) - can be positive or negative – a negative NPV is usually not acceptable. You want to invest in a project with a higher NPV.

Internal Rate of Return (IRR) – The IRR is the discount rate that makes the NPV equal to zero. You would want to invest in a project with a higher IRR.

Discounted Payback Period – Because the life of the building is so long, and we are forecasting out cashflows forty years into the future, the time-value of money must be considered. The Discount rate is applied to the cash flows to develop a discounted cash flow, and that is used to determine in which year the building has paid for itself. The shorter the payback period, the better the investment.

The first set of results is for the larger-sized building and includes the cost of all construction – including the community area.

Larger Building - All costs of construction

| | 50% reduction of estimated use | | 60% reduction of estimated use |
|---|---|---|---|
| NPV | $670,628 | | ($1,547,277) |
| IRR | 3.16% | | -1.19% |
| Discounted Payback Period (in years) | 31 | | Beyond useful life |

Note that when the revenues are decreased to 60% of the estimated take rate the results fall into the unfavorable area.

There is an argument that the community room is being provided for community benefit, and its cost should not be included in the amount used to calculate the return on the building - the idea that the revenues from the hangar should only have to cover the costs of the hangar – not what is being built for the community. The next table shows the result of the calculations for the larger-sized building, but with the cost of the community area (detailed by C&S) excluded. The revenues related to the rental of the community

room have likewise been backed out and the operating expenses reflected are for the hangar only.

Large Building - Excluding Community Area

| | 50% reduction of estimated use | | 60% reduction of estimated use |
|---|---|---|---|
| NPV | $1,549,561 | | ($668,343) |
| IRR | 5.10% | | 0.42% |
| Discounted Payback Period (in years) | 22 | | Beyond useful life |

As expected, the NPV and IRR increased and the number of years required to payback the investment decreased.

The C&S report did not go into a great deal of detail on the smaller building, other than to detail construction costs. Using those amounts and ratios of the revenues and expenses, the following two sets of information were developed. The first table includes all costs of construction.

Smaller Building - All costs of construction

| | 50% reduction of estimated use | | 60% reduction of estimated use |
|---|---|---|---|
| NPV | ($151,242) | | ($1,619,486) |
| IRR | 1.69% | | -2.75% |
| Discounted Payback Period (in years) | Beyond useful life | | Beyond useful life |

It is unknown what the effect on the revenue projections developed by C&S would be if the smaller sized hangar was built. Staff used 67% of the revenues – realizing that fewer planes would fit at any one time. That is an estimate which has a material effect on the calculations. If the Board is interested in further evaluation of the small hangar, it may want to request that more evaluation of the anticipated revenue be performed. The second table excludes the community area, similar to what was shown above.

Smaller Building - Excluding Community Area

| | 50% reduction of estimated use | | 60% reduction of estimated use |
|---|---|---|---|
| NPV | $311,683 | | ($1,174,313) |
| IRR | 2.87% | | -2.03% |
| Discounted Payback Period (in years) | 33 | | Beyond useful life |

The exclusion of the community area from the building costs provides the one scenario where all the factors have a positive value for the smaller sized structure. As mentioned above, the results would be different if the assumptions were to change. If anyone would like the calculations run with different assumptions, please let me know. Based on the results shown in this report, the scenario with the best return would be the large building – calculated without the burden of the community area costs.

**TRUCKEE TAHOE AIRPORT DISTRICT**
**INTEROFFICE MEMORANDUM**

**TO:** BOARD OF DIRECTORS AND STAFF

**FROM:** HARDY S. BULLOCK, DIRECTOR OF AVIATION & COMMUNITY SERVICES

**SUBJECT:** ANALYSIS OF POSSIBLE OPERATIONAL INCREASE / HANGAR 3

**DATE:** APRIL 17, 2014

**ATTACHMENT:** OPERATION IMPACT SATURATION ANALYSIS TABLE

The Board of Directors discussed the operational impact of building a multipurpose hangar at the April 23, 2014 regular meeting. Staff was directed to analyze the potential impact of this hangar as it relates to operational activity, potential increases in air traffic, and community annoyance. In addition, staff has engaged Mead & Hunt to provide a professional opinion regarding the operational impact of the potential multipurpose hangar. Using operational data and accepted forecasting principles, Mead & Hunt has re-examined the assumptions made in the C&S report dated April 23, 2014 and if there are any effects on the Aviation Forecast they completed as part of the Master Plan. Their memo is attached to the Staff Report.

Staff has examined the impact from a saturation standpoint and measured exposure by vacant days. Because Hangar 3 has a maximum capacity, one can assume that when it is full, additional operations may not be attributed to its existence. Attachment A is a max saturation by days, 100% occupancy illustration. The goal is to develop an understanding of the total exposure related to surplus hangar availability and how that relates to overall monthly and current annual operational activity. Because the Truckee Tahoe Airport has peak seasonal activity, certain months will generate higher levels of exposure to increased operations. For the purpose of this analysis, staff has assumed that three aircraft is the maximum average utilization potential for Hangar 3. Operational figures used in Attachment A are factual and gathered from actual point of sale data or from approved quarterly comments and operations reports. The portion that requires interpretation is the estimation of the take rate. Staff has assumed that 3 out of 10 potential customers that have historically stayed overnight will take the hangar. While this variable is subject to change, the

total exposure days can never exceed the maximum total exposure.

The analysis demonstrates what a maximum annual operational percentage increase might be. This methodology assumes the following:

1. A certain percentage of current operators already coming to Truckee and included in our current operations counts will use the hangar.

2. All other hangar occupancy will be new operators generated from the hangar's existence that currently choose not to fly to TRK due to a lack of de-icing or indoor storage for their aircraft.

3. We assume for a max saturation scenario that for every day of vacant hangar exposure, 3 new airplanes will fly here to fill the hangar.

The max ops increase is based on this max saturation assumption. Under the monthly column, max monthly represents the operational increase driven by hangar vacancy exposure. Staff can run different scenarios with this methodology. EXAMPLE - if the hangar is vacant 50% of the time and the operational impact (if one chooses to attribute all operations to the hangar) would be 3.5% annually.

Max monthly percentage increases are summed to create an average max annual operational increase potential of 7%. Multiplying this ratio against an average annual total operational figure of 25,000 one can assume, in a max saturation scenario, the District may receive up to 5 comments per year attributed to additional operations attributed to the Hangar 3. This assumes all operations are new, all operations are driven by the hangars existence, not external demand, and that the hangar is full with 3 aircraft per night 365 days per year. It is staffs opinion that this scenario is highly unlikely and supports the conclusion of the Mead & Hunt memo, however, the methodology creates a convenient way to quantify hangar vacancy, exposure, and max potential impact. It should be noted that if the max occupancy scenario is accurate, revenue from the Hangar would be over $500,000 per year.

Many variables outside the control of the Airport would influence the assumptions here, some of these include:

1. Aircraft that come here and wait for a vacancy in the hangar.
2. Aircraft that choose to stay for extended periods.
3. Periods of inclement weather.
4. Changing fleet mix.

DATA: ACTUALS SOLD 2013 TTAD

EXHIBIT A

Potential Operational Increase/Exposure Hangar 3 Build

| | 1<br>January | 2<br>February | 3<br>March | 4<br>April | 5<br>May | 6<br>June | 7<br>July | 8<br>August | 9<br>September | 10<br>October | 11<br>November | 12<br>December | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TU2 | 1 | | | 1 | | 1 | 1 | 2 | 1 | 1 | | | 8 |
| TU3 | | | | | 1 | | 3 | 13 | 3 | | 1 | 1 | 22 |
| TU4 | 7 | 6 | 1 | | 4 | 4 | 16 | 8 | 12 | 5 | 6 | 4 | 73 |
| TU5 | | 5 | 2 | | | | | | | | | | 7 |
| | | | | | | | | | | | | | |
| TAKERS "BIG 6" | 8 | 11 | 3 | 1 | 5 | 5 | 20 | 23 | 16 | 6 | 7 | 5 | 110 |
| TAKERS "POTENTIAL" | 17 | 47 | 20 | 3 | 19 | 59 | 82 | 119 | 32 | 25 | 15 | 19 | 457 |
| ALL | 25 | 58 | 23 | 4 | 24 | 64 | 102 | 142 | 48 | 31 | 22 | 24 | 567 |
| SATURATION "BIG 6" | 2.7 | 3.7 | 1.0 | 0.3 | 1.7 | 1.7 | 6.7 | 7.7 | 5.3 | 2.0 | 2.3 | 1.7 | 36.7 |
| SATURATION "POTENTIAL" | 5.7 | 15.7 | 6.7 | 1.0 | 6.3 | 19.7 | 27.3 | 39.7 | 10.7 | 8.3 | 5.0 | 6.3 | 152.3 |
| TOTAL SATURATION (30%) | 4.4 | 8.4 | 3.0 | 0.6 | 3.6 | 7.6 | 14.9 | 19.6 | 8.5 | 4.5 | 3.8 | 3.6 | 82.4 |
| TOTAL OPS | 1503 | 1495 | 1297 | 882 | 925 | 1336 | 1865 | 1786 | 1245 | 1040 | 850 | 1170 | 15394 |
| % OF TOTAL OPS | 1.66% | 3.88% | 1.77% | 0.45% | 2.59% | 4.79% | 5.47% | 7.95% | 3.86% | 2.98% | 2.59% | 2.05% | |
| TOTAL EXPOSURE DAYS | 25.6 | 21.6 | 27.0 | 29.4 | 26.4 | 22.4 | 15.1 | 10.4 | 21.5 | 25.5 | 26.2 | 26.4 | 277.6 |
| MAX OPS INCREASE | 154 | 130 | 162 | 176 | 159 | 135 | 91 | 63 | 129 | 153 | 157 | 159 | 1665.8 |
| MAX MONTHLY | 0.62% | 0.52% | 0.65% | 0.70% | 0.63% | 0.54% | 0.36% | 0.25% | 0.52% | 0.61% | 0.63% | 0.63% | 6.66% |
| MAX ANNUAL INCREASE % | 7% | | | | | | | | | | | | |
| OVERALL ANNUAL COMMENTS | 5 per year based on average annual comments ratio of 50-100 per 25,000 operations | | | | | | | | | | | | |

**TU2-5** are overnights sold in 2013

**TAKERS "BIG 6"** are common carriers such as Net Jet, Flight Options, Jet Suite etc.

**TAKERS "POTENTIAL"** are all other customers who spent the night at KTRK on TU2-TU5

**SATURATION "BIG 6"** based on 3 AC/night with an accepted take rate of nearly 100% expressed as max occupancy/days

**SATURATION "POTENTIAL"** is the Big6 taking the hangar 100% and the Potential taking it 100% expressed as max occupancy/days

**TOTAL SATURATION (30%)** is a staff estimate that 3 out of 10 Potential customers would take the hangar (this is adjustable)

**TOTAL OPS** is the measures, powered aircraft operations per approved report Q4 master 2013

**% OF TOTAL OPS** is the ratio of the ALL visitation to total monthly operations

**TOTAL EXPOSURE DAYS** are the days that the hangar is vacant. These days the hangar could have additional AC come and use it

**MAX OPS INCREASE** is 3 aircraft per day multiplied by the total available nights; worst case scenario 100% take rate

**MAX ANNUAL** is the ratio of increased aircraft operation by month based on exposure and annual operations of 25,000

**MAX ANNUAL INCREASE %** is the relative ratio of potential new operations based as the sum of all months. This assume 100% take and 100% occupancy

**OVERALL ANNUAL COMMENTS** is the total number of expected annoyance comments based on averages from past reports

**OTHER FACTORS COULD REDUCE OPERATIONS:** Repositioning flights could stay here in the hangar instead of going elsewhere to overnight or deice/anti ice

**SIERRA AERO SOLD 19 OVERNIGHT**: 19 in four months, potential 57 additional takers per year on the ROI side assuming no A9 no Sierra Aero