TRUCKEE TAHOE AIRPORT DISTRICT SAFETY GAP ANALYSIS 5-YEAR UPDATE

2021 Final Report

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EXECUTIVE SUMMARY

The Truckee Tahoe Airport District (TTAD) established a formalized Safety Management System (SMS) managed by a dedicated Safety Manager in 2015. The related Gap Analysis and Safety Assessment produced actionable findings and recommendations. They were written to fulfill regulatory requirements, adopt industry best practices, and address local operational hazards and risks. Since the initial robust effort over five years ago, airport management has institutionalized and resourced a perpetual safety strategy meeting operational and support services growth enabling a culture of safety. It is readily apparent in 2021 the strategy and culture have taken hold and are interwoven throughout airport activities, personnel, planning, and community engagement. The advancement of the safety culture is not only impressive but extremely unique as few airports of its size and scale have achieved the same or even attempted it. Management and staff should be recognized for their foresight to achieve this back in 2015.

The concept of executing a 5-year Gap Analysis evaluates the efficiency and effectiveness of the SMS pillar: Safety Assurance. This quality-focused effort specifically ensures TTAD continuously practices its safety program, and the safety program continues to remain relevant and proactive as the airport grows and the operating environment changes. It is important to note that several iterations of an SMS growth strategy have also occurred over the last five years and those efforts and events are addressed in this report.

In the interest of continuity and comparisons, this report is outlined and designed in a congruent manner to its predecessor document. Similar to the 2015 gap analysis, this effort was extremely comprehensive, with hundreds of observations and thousands of data points. To communicate the findings in a concise manner, Falcon16 Solutions has chosen to provide a relatively brief narrative of the key points, findings, and recommendations, supplemented with multiple appendices that include the raw data for those who wish to go in-depth. A 12-month consultation service by our Subject Matter Experts (SME) will enable consistent and on-demand advisory efforts specific to this report and the follow-on efforts.

While there was a specific focus of this gap analysis, we maintained a wide aperture of observations pertaining to the airport's operation, support structure, culture and climate, and short/long-term strategies. This report is organized to provide specific objective analysis and data-based recommendations. Where subjectivity is utilized, it was done so based on the vast experience and knowledge of our entire team. We have included specific recommendations within the data analysis and findings, as well as major findings and recommendations in the Executive Summary section. Multiple appendices are included with raw data and a Functional In-Depth Review of improvement opportunities.

Overall, this comprehensive Gap Analysis is intended to provide a review of the last five years, an insight of the current culture and safety program, and a forecast of improvements and requirements to meet evolving operational and community expectations. Most importantly, to provide the best solutions contributing to the airport's Mission Statement:

The Truckee Tahoe Airport aims to provide safe, high-quality services and facilities, reduce impact on airport neighbors and the environment, and invest in opportunities that increase community safety and provide sustained benefit to the entire Truckee Tahoe region.

Background, Objectives, Strategies and Data Collection

Background

The purpose of this 5-year Gap Analysis is a reassessment of the organization's safety programs and policies in order to improve and align the processes with best industry practices and regulatory guidance. This Gap Analysis provides analysis of all operational functions including Operations, Maintenance, Safety, Airspace, and Infrastructure. This effort produces several deliverables and consultative engagements focused on the following two outcomes:

1. Identifying gains and developing gaps in safety program strategies since 2015 relevant to the operational and infrastructure growth.
2. Integrating these opportunities of improvement into the existing SMS structure ensuring prudent foresight of safety planning strategies against evolving hazards and risk.

The original 2015 Gap Analysis was designed with the goal of answering two strategic questions which remain relevant and of significance in this analysis:

"What can the airport control and not control with regard to safety, and

how can the airport best implement continued improvements to overall safety?"

Objectives

The objectives of this 2021 Gap Analysis and Safety Assessment are:

1. Conduct an objective and subjective review of current programs, policies, and practices.
2. Evaluate actions derived from the 2015 Gap Analysis and implemented to scale.
3. Diagnose the airport's safety "program health" through qualitative and quantitative data.
4. Evaluate the safety culture of encompassing employees, tenants, and operators.
5. Identify existing or evolving issues of safety not currently addressed.
6. Evaluate the impact made by the Safety Manager, Directors, and General Manager.
7. Assess the evolution and utilization of the existing SMS software tools and strategies.
8. Evaluate communications with tenants, operators, stakeholders, and the community.
9. Benchmark these findings against industry best practices.

Each objective is evaluated in the context of each of these safety-related topics:

1. Culture
2. Risk management
3. Quality and Compliance
4. Training

5. Safety practices and awareness
6. SMS components and readiness
7. Scaled operations
8. Communications

Strategies of Data Collection

To build upon the baseline of the 2015 Gap Analysis and subsequent Airport Safety Office accomplishments, Falcon16 Solutions adopted the original "four-pronged" strategy of data collection and redesigned it into six Gap Analysis "pillars of safety excellence."

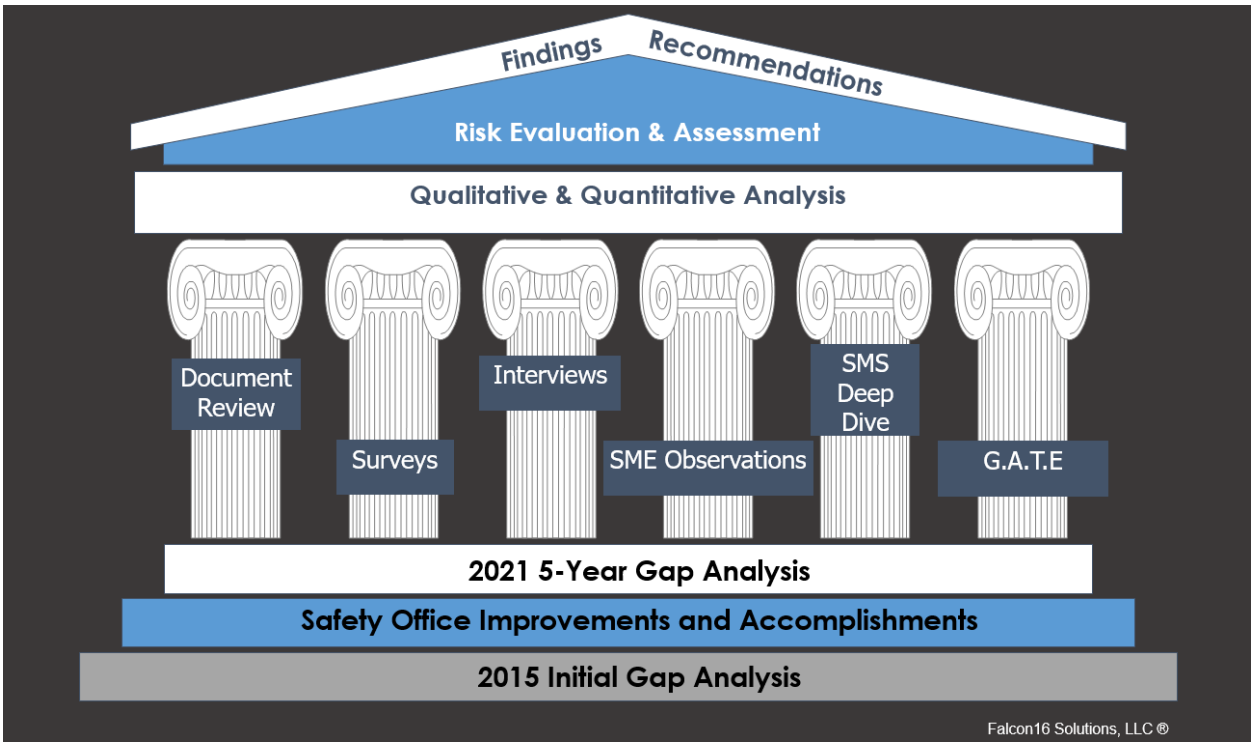

Figure 1 – Gap Analysis Pillars of Safety Excellence

The Pillars in detail:

1. **A thorough document review**. Falcon16 Solutions Subject Matter Experts (SMEs) conducted a thorough review of all of Truckee Tahoe Airport's current documentation, policies and procedures, and manuals; to include the 2015 Gap Analysis Report.
2. **Online surveys**. Three separate surveys were designed and distributed to the respective demographic groups on 26 April and made available through 21 May. The surveys were designed, managed, completed, and analyzed using on-line SurveyMonkey® application and software.
3. **Formal and informal interviews.** Interviews were conducted via face-to-face meetings during the week of 27-30 April 2021, and additional phone interviews were conducted in the following two weeks. Pre-planned interviews were scheduled and conducted with all

airport Directors, Managers, Tenants, and available operators. The interview process consisted of a single questionnaire bank focused on the safety culture, safety program knowledge, and engagement. It also addressed perceptions of risk management, safety training, and overall safe operations qualifiers. The purpose of the interviews was to obtain discussion-based information providing a comparison to the 2015 Report and to assess current conditions. Overall, 15 interviews were conducted.

4. **Subject matter expert (SME) observations**. Both active and passive observations made during the April 2021 visit produced data points which generated or contributed to Findings & Recommendations, as well as duplicated and amplified cited issues discovered via survey, interview, and compliance checklist efforts.

   The observations included the airport operational layout, a complete airport property driving and walking tour, and flight operations and O&M operations in progress.

5. **Safety Management System (SMS) Deep Dive.** The Safety Manager allowed and enabled access by Falcon16 Solutions to the local Vortex® SMS. A thorough analysis (AKA deep dive) was conducted of all functional areas and processes within the system.

6. **Gap Analysis Tool of Excellence (G.A.T.E.).** A compliance matrix was utilized to assess the current conditions of Safety Office and Safety Program adherence to Regulatory requirements, local policies, and industry best-practices. This tool was redesigned to mimic that which was used in the 2015 Gap Analysis. It provides for a constant assessment tool of effective safety strategy change management as personnel, operations, policies, and the environment change abruptly or insidiously over time.

Functional In-Depth Review

The next phase following data collection was the Functional In-Depth Review (Appendix 03). We based our findings and recommendations on an analysis of these datasets, compared and contrasted with industry best-practices and top tier safety programs and standards both domestic and internationally based. These included:

- Federal Aviation Association (FAA) and the European Aviation Safety Association (EASA) guidance on airport safety management systems
- FAA and EASA guidance on airport safety office management
- Industry expertise and publication references on safety manager roles and responsibilities
- International Standard for Business Aviation Operations and Aircraft Handing (IS-BAO/IS-BAH) documents
- Comparisons with like-sized airports and similar operations
- Previous TTAD audits aimed at safety, operations, airport business practices, etc.
- Subject Matter Experts familiar with the administrative, environmental, and operational aspects of the Truckee Tahoe Airport

Data Collection and Analysis

In this section, we will identify key insights derived from the data, and include some focused recommendations. These recommendations also appear in the **Major Findings and Recommendations** section of this report, but are duplicated here to put them close to the analysis, so that the reader can see the logic and connections drawn directly from the document review, surveys, interviews, and observations.

Document Review

The purpose of the document review was to establish a working knowledge of written documentation made available to airport management, the TTAD Board, employees, and tenants and operators.

Falcon16 Solutions was provided open access to airport guidance and documents. A review of several documents (**Appendix 09**) established the written reference material from which operations are conducted and strategic decisions are derived. No specific findings were identified in this document review however, those listed in the Major Findings and Recommendations section will require (if adopted) edits and updates to align with the adopted changes.

Following the document review process, we fielded two surveys to gather more insights.

Online Surveys – User's Guide

The following three non-scientific surveys were distributed to three distinct demographic groups associated with the airport. The three groups are 1) Airport Employees, 2) TTAD Board, Stakeholders, and the Public, and 3) Airport Operators and Tenants. Each group survey contained a different set of questions focused on opinions, observations, knowledge, and qualitative commentary regarding airport safety matters. Each survey was accessed through a specific URL link providing access to the appropriate survey utilizing SurveyMonkey® application and software. The completed surveys were anonymous and the data set refrains from identifying individuals by name or position, if such information was directly included or inferred in responses.

Each survey question was designed to capture quantitative data sets used to identify current conditions as well as a comparative value against previous surveys with similar data, specifically the 2015 Gap Analysis surveys. Most questions requested additional commentary based on specific answer selections in order to amplify causal or contributing factors to the individual's selection. The commentary was collected via free-text designated blocks following certain questions and is available in raw format in Appendix 1.

The analysis is non-scientific as it did not weigh the data to adjust for any sampling or data collection biases. The type of analysis involved is both quantitative and qualitative at a basic level providing for time-sensitive statistical data. Either analysis type provides a degree of predictive analytics based on historical data, established trends, and existing tools (i.e., Risk Matrix).

Of note, the summary analysis following each survey question and result is based on the collection, interpretation, and presentation of data identifying and uncovering some patterns, trends, and standard deviations. This summary analysis is in conjunction with known safety trends, Gap Analysis on-site observations, interviews, and comparisons with regulatory guidance and industry best practices. It is intended to provide a guided discussion and further in-house analysis.

It is highly recommended for the General Manager to further analyze the survey data with select staff members. Subsequent analysis is conducted in order to provide context to and from the data set in relation to the airport culture, operations, and prioritized strategies and associated projects/programs.

Each survey group collected a # of Responses, a survey completion rate, and average time spent on the survey itself. Since the surveys were similar in design and question count, it is assumed the disparity in average time spent is relative to the amount of free-text commentary provided.

Interview Summaries

A total of 15 personal interviews with airport employees, operators, tenants, and management were conducted by Falcon16 Solutions personnel. Interview questions and discussions covered eight topics: *Culture*, *Risk Management*, *Compliance*, *Training*, *Safety*, *SMS*, *Operations*, and *Communication*.

Three primary demographic groups were intentionally identified in order to obtain a cross-section of perspectives, responsibilities, and experience, and they were *Management*, *Employees*, and *Tenant/Operator*. Each group was asked a set of ten standardized questions (**Appendix 04**) intended to cover the eight topics, however open discussion on an array of topics was welcomed and exploited. The method of one-on-one interviews followed a sequence of introduction, explanation of intent and questions, and Q&A discussion, which lasted approximately 30-45 minutes, on average. Two interviews were conducted via phone. A composite analysis of all answers was done in order to assess the common responses and outlier responses.

SME Observations

The opportunity for Falcon16 Solutions personnel to observe airport operations and support functions proved worthwhile and extremely valuable while subsequently assessing interview and survey data. The interactions with airport personnel, operators, and access to all of the airport provided for a comprehensive perspective.

Overall, the Safety Office has done a tremendous job growing the safety culture supported by a now-robust Vortex® SMS. The culture is prevalent with the workforce, management, and TTAD Board as “safety” is routinely incorporated in discussions, decision-making, and stakeholder engagements. The Safety Manager has adopted several industry best-practices while innovating and developing several local practices to address the operation, workforce, and environment. **The Truckee Tahoe Airport safety culture is a benchmark of excellence to only be improved upon with “Next Level SMS” strategies and practices.**

Overall, there were not any observations during the April 2021 visit which prompted an elevated concern requiring immediate attention to address unknown/unmanaged hazards or prevent an impending mishap.

Discussion for Reference and Consideration

Risk Matrix User's Guide

This section is designed to provide the reader with the safety science background upon which our recommendations are based. When evaluating observation, survey, and interview data while compiling this report, the following risk mitigation and safety tools were referenced: the "how to" of utilizing a Risk matrix (Figure 2), and Reason's Swiss Cheese Model (modified) (Figure 3). Airport management and personnel are encouraged to utilize both in future planning and risk management efforts. Threat and Opportunity Window

The Risk Matrix is a common tool utilized to quantify the evaluated risk based on likelihood (or exposure) and consequences, and then qualify the actions taken to mitigate such risk. The graphic below provides a brief explanation of sequential steps when using the matrix. This baseline understanding is important to evaluate a similar Finding and associated Recommendation in this report. While the strategic tool of Risk Management was recommended in the 2015 Gap Analysis Report, this graphic and subsequent discussion are focused on Next Level SMS strategies. A next level Safety Risk Assessment (SRA) tool is found in Appendix 9. The Safety Manager will gain an understand and proficiency in its purpose and use for follow-on training with airport personnel.

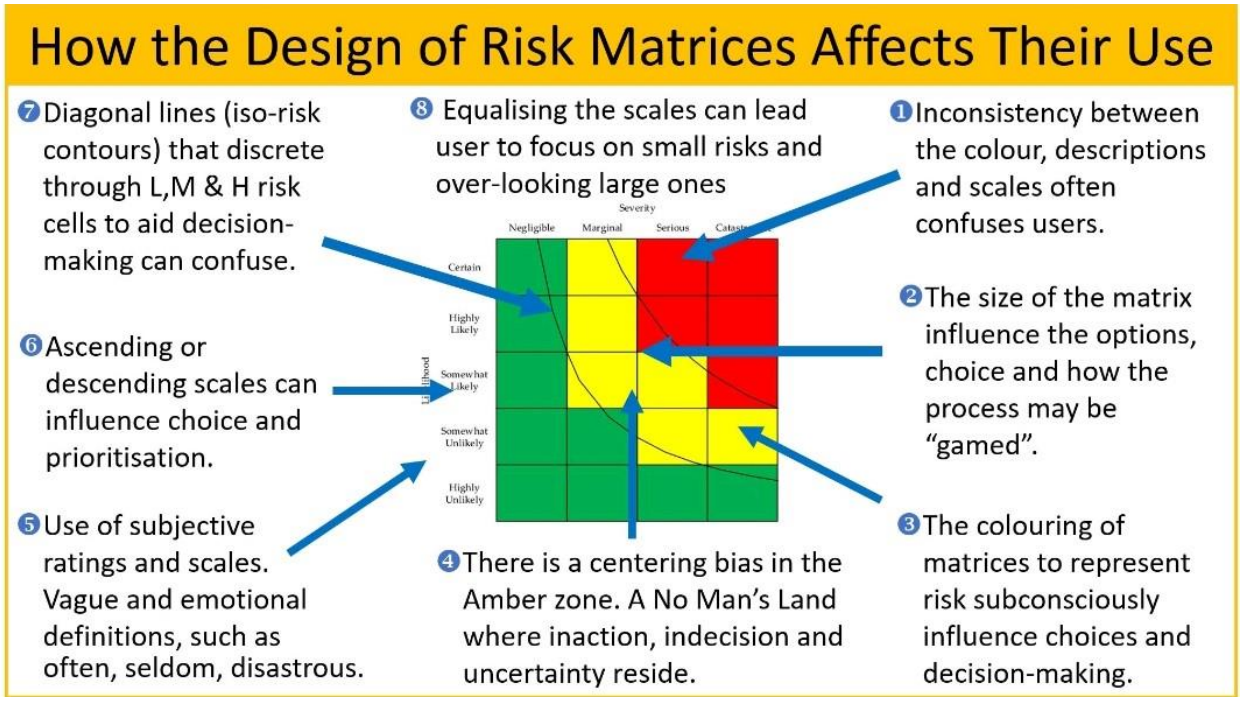

Figure 2 – The Design of the Risk Matrix

James Reason's Swiss Cheese Model (Modified)

In the early 1980s, James Rason proposed the image of "Swiss cheese" to explain the occurrence of sequential failed system and process barriers in the context of a mishap. This metaphor provides a visual representation of the system barriers put in place to prevent hazards caused by humans from manifesting into an undesired outcome (AKA accident). The hazard (arrow) will penetrate established barriers if allowed to through latent failures (AKA holes), and if unstopped the mishap occurs.

This version of Reason's Model is modified to accommodate the operation, systems, and environment at TTAD. The nine barriers are local elements within the General Manager's control and are also common points of failure in relevant mishap case studies. Consider this visual, or a further developed version, when analyzing and considering the recommendations associated with the findings of this report.

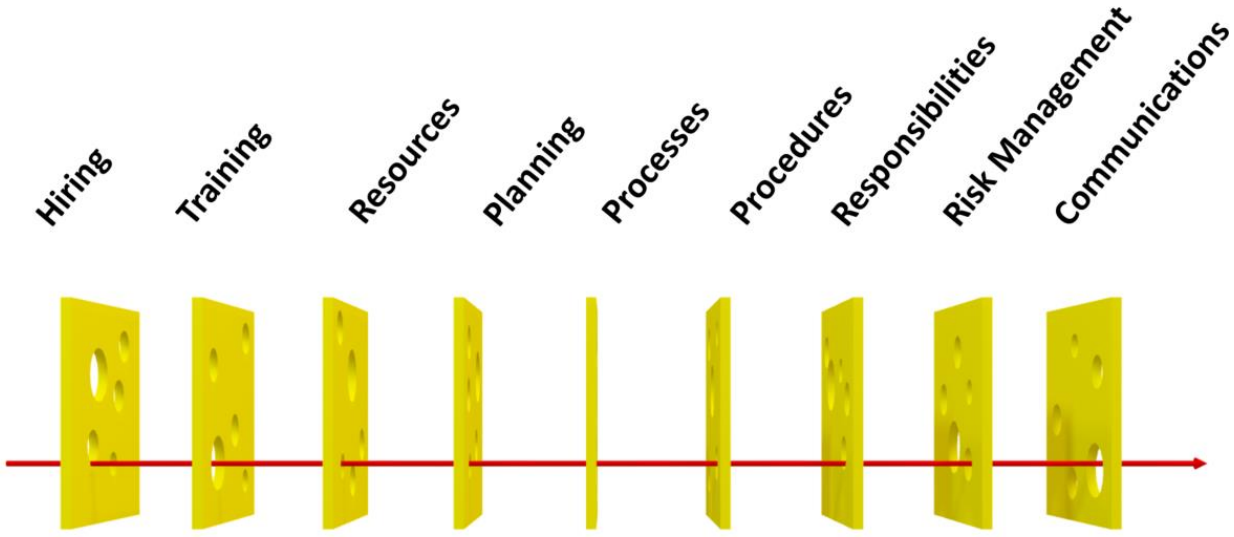

Figure 3 – Reason's Swiss Cheese Model (Modified)

Major Findings and Recommendations

User's Guide

This section provides for the outcomes of analysis compared to regulatory guidance, industry best-practices, and sound Risk Management culminating in "Findings" of gaps in implementation, process, policy, and/or practice. The subsequent "Recommendations" are written to guide the airport to the best solution and/or options to consider while closing the identified gaps.

Each Finding and Recommendation is designed to lower the associated risk to the lowest possible level while not impeding airport operations, business practices, or community impact beyond acceptable means. Each contains a summary of the Finding, a Recommendation narrative consider or follow, and a Discussion section to generate and guide local discussion

and resulting strategies and decisions. **Neither Findings or Recommendations must be followed, but the associated risk is then inherited and accepted by the decision-makers in this case.**

An associated Risk Level is assigned to each Finding and Recommendation at either the High ♦, Medium ♦, or Low level ♦. Of note, this color code is slightly different from the 2015 Gap Analysis report however, the strategy to determine the risk levels is the same. That strategy is based on the likelihood and consequence of the associated unmanaged hazards and threats causing damage, injury, or worse outcomes. It also considers personnel, business practices, and stakeholder and community impact.

The following Findings and Recommendations are not in order of priority or time sensitivity. They are listed according to the assessed risk level (i.e., High, Medium, Low), however there is no order of precedence within those levels. The aspects of the overall assessment should be considered based on priorities, expectations, interpretations, and resources. Of note, there are no Findings assessed as High-Risk Level, observed or reported.

Finding: Realignment of the Safety Office

There are six goals in support of the safety mission statement, which highlights that "all [employees) are safety coordinators". The Safety Manager, who also fulfills the Security Manager role, clearly leads this endeavor by example. The safety office at TTAD has made significant improvements to the processes and procedures surrounding the daily operations and interactive management of the Vortex® software at the heart of the SMS. The developed safety culture can be defined as "instrumental, healthy and engaged" while continuing to evolve as a strategic tool for business, planning, operations, support, and community relations. The position was realigned in 2015 per managerial decision based on a previous safety report recommendation. The position now reports directly to and is supervised by the General Manager. This realignment within the organizational hierarchy was intentional and strategically communicated through multiple efforts. The key message being communicated was to clarify the delegated authority and responsibility of the Safety Manager to speak and act on behalf of the General Manager.
The Safety Manager is responsible for and conducts all aspects of the safety office, related programs, and implementation of the overall safety strategy. On top of the aforementioned responsibilities, this person is also responsible for all aspects of physical security, related programs, and implementation of the overall security strategy. It is not uncommon to align this office of significant responsibility. The overall workload of the individual responsible for both is significant by itself. However, the additional unrelated responsibilities and duties by direction, assignment, and/or the natural association and relation to Directors and other Managers exceed a reasonable person's capacity. This organizational demand and alignment of additional duties is not in accordance with industry and safety program standards, or best practices. This dynamic dilemma also dilutes attention, diligence, and time needed to effectively focus on all aspects of safety and security. The increased risk evolves when even minor distractions or

deviations from primary task loads, or lack of safety oversight can enable unmanaged risk and hazards to evolve into an event or mishap.

Risk: Medium 

Recommendation:
The span of control inherent with both safety and security programs coupled with additional projects and roles adjacent to primary ones, the overall scope and scale of responsibilities of this position should be reconsidered. These two primary programs carry significant impact on strategic objectives and day-to-day operations. A few examples of these are: policy requirements, established procedures, management of data, communications, co-worker, and customer engagements, and in some cases regulated and legal compliance.

A few options exist to satisfy this recommendation and move towards a next level SMS strategy, if chosen to do so.

1. Group all safety functional areas of responsibility under the Safety Manager while allowing for process-driven collaboration with the airport Directorates in respect to their functional areas. This involves migrating Aviation Safety program and responsibility into the Safety Office as the office of primary responsibility.

2. Define and limit the Safety and Security Manager position strictly to those efforts associated with those two critical roles. Identify all primary and secondary duties associated with the Safety Manager's role. Prioritize those duties and direct efforts and resources associated with these rated essential over all other adjacent projects and roles allowing for discretion to defer or alienate all non-essential efforts. Involvement in adjacent projects and roles should be common considering likely safety and/or security impacts however, it should only be in an advising role or as part of a "team" led by another individual.

3. Develop and fill a position directly under and supervised by the Safety Manager. This new role would be working in a support role to accomplish tasks and responsibilities as designated by the manager or defined specifically in a job description.

4. Consider a hybrid of the three options above combined to maintain the existing workload of the Safety Manager supported by an Assistant Safety (and Security) Manager. This Safety Office structure would be conducive to grouping all safety functions under a single office, to include Flight Safety. (See Finding and Recommendation "SMS Workflow Redesign" for more details on collaborative SMS workflows).

Discussion: Employers have a responsibility to provide a safe workplace for their employees and stakeholders. It is the sole responsibility of a dedicated Safety Manager to make sure

employees feel safe and are protected from all potential hazards. A Safety Manager is an expected leader in the workplace. This takes form in being able to motivate and inspire other employees so that everyone buys into safety rules and works together to make sure the workplace is as safe as possible. A high attention to detail helps the Safety Manager examine workplace conditions to make sure they conform to organizational, FAA, and OSHA standards. The same applies to aspects of the Security Manager role.

Finding: SMS Workflow Redesign

The Vortex® SMS software application with cloud-based data storage is the primary tool for the Safety Manager to accomplish the daily tasks and data management involving safety reports, investigative matters, conclusive mitigation recommendations, and communications to all with access to the system.

The SMS workflow is designed to process reported hazard and event information and analyze it through standard safety investigative steps. It enables root cause analysis and subsequent outcomes of Findings and Recommendations with embedded historical documentation for future reference. The communication loop is critical to ensure the most efficient timeline from report to outcomes, as well as supporting a just culture based on trust.

The Vortex® SMS report log is populated with a significant amount of safety reports. A five-year review of all reports and frequency indicated a maturity of the system, its use, and oversight. That maturity has outpaced the original process and supporting policies relative to multi-discipline engagement and use of the system. It is logical that the initial setup of Aviation Safety under a Directorate (i.e., AvCom) instead of an autonomous Safety Office allowed for SMS workflow inconsistencies as report numbers increased. Through observation this appears to be more of a policy and process issue than a personnel issue. Within the SMS maturity evolution over the five-year period, it induced inefficiencies to the overall SMS strategy and derived outcomes. However, the alignment of the Safety Office as a direct report to the Airport Manager coupled with system maturity has proven to effectively identify more hazards and manage all known risks.

The Vortex® SMS allows for published (visible to all with access) and unpublished (visible only to the Safety Manager) reports. The purpose of an unpublished report is twofold. An unpublished report, optionally defaulted to this status upon initial deployment of Vortex, was created to manage information of a “sensitive” nature to the Airport, its management and/or staff. The unpublished report may be “sanitized” to a degree in which it can be moved to a “Published” status once sensitive information has been managed to a level appropriate and as decided by the management team. An unpublished report, in a Just Culture reporting environment helps maintain a positive reporting culture, while also recognizing the sensitive or “raw” nature of some reports to public scrutiny may be misinterpreted or taken out of context before the report has been managed to acceptable levels through the SMS reporting flow process.

Unpublished reports can also provide anonymity to those individuals, functional areas, or organizations involved with the report.

A designated "Gatekeeper" who is a trusted, non-partisan and safety focused management team member, manages the information in both statuses during the workflow process. However, certain disciplines of responsibility, not subject to the investigation, may need access in either status to provide input, maintain situational awareness, and/or provide quick RM analysis to maintain or return to normal operations with existing unmitigated hazards still present.

Risk: Medium 

Recommendation(s):
Analyze the existing Vortex® SMS workflow to identify where and when the Directors need to/should have access to reports in progress, whether in the published or unpublished status. Determine a new adopted process to include those individuals when appropriate, and dry run that process against existing 'closed' reports to ensure the objective has been met. Recommend developing standard communications within Vortex® SMS and emails to support this process while protecting the personal information of those subject to the investigation (ex., email subject lines titled, "Safety Sensitive – Do Not Fwd"). The Director's access will be for passive observation or active participation (i.e., inputs, uploads, etc.) in the investigation and report writing process. The intent is to improve timely, correct, and clear communication within the workflow to include appropriate levels of management in the investigative process for inclusive input and/or awareness.

Recommend AvCom and O&M Directors take on the responsibility of writing safety event reports pertaining to their respective functional areas of responsibility. The criteria for these designated report writing assignments are to be determined by the General Manager based on degrees of damage, injury, cost, and impact on operations. A report template within Vortex® SMS enables efficient yet effective report writing efforts. Investigative and writing assignments may be designated to individuals working for the specific Directors, however the work would be accomplished "outside" of the Vortex® system and uploaded by those with access to the unpublished reports. Falcon16 Solutions will provide upon request up to four 1-hour training tutorials within four months of this report to inform designees on report writing to include facts organization, root cause analysis, evidence cataloguing, summary analysis, etc.

All completed draft reports are then reviewed by the Safety Manager with required feedback of needed/recommended changes or consent to publish.

Discussion: The Safety Manager has successfully established a localized SMS workflow in order to manage the workload associated with safety reports. The reports are accomplished in a timely manner relative to the hazard and associated risk level(s) involved. While it is a common practice to report and record all identified hazards and risks, it is an overall task load that can become too time consuming and overwhelming with repeated "low risk" events. However, the

benefit of a growing data set of safety reports is the ability to identify and track trends, which allow for proactive safety measures. Also, increased participation in the Vortex® SMS by Directors and select Managers improves the overall safety culture, risk awareness, and team-focused approach to safe operations.

Considering the tremendous improvement of the established airport SMS over the last five years, it is logical to look at next level SMS growth of the system and the strategy. An important part of this process is to consider 1) what can be done to improve the efficiency of hazard and risk management, 2) who else can contribute to that process, and 3) what can be done to amplify the effectiveness of the Safety Manger's daily roles and overall impact on the culture of safety?

Finding: Next Level Risk Management

The Safety Office has adopted, implemented, and codified the use of a Risk Matrix to determine a Risk Index when applicable. A recommendation in the 2015 Gap Analysis Report cited the need for a formalized Risk Management (RM) program with standard tools and techniques, and this has been accomplished successfully. The next phase of RM implementation is to develop a strategic, and on-the-spot decision making process. This requires a comprehensive RM approach to all functional areas of the airport and training for all employees. Risk assessments are absolutely central to decision making focused on hazard mitigation within an SMS and are critical in a high-operational tempo environment.

The airport RM decision hierarchy is largely decentralized to supervisors and the workforce is entrusted with critical decisions and adapting to change across all functional areas and operational locations. Absent the theoretical understanding and practical ability to use and apply a RM matrix both in strategic planning and on the job, the workforce is susceptible to mismanaging hazards and risks. This leaves a gap of coverage in the overall risk management strategy on a routine basis as often as daily.

Risk: Medium 

Recommendation:
Develop a RM "implementation and sustainment plan" to address initial comprehensive training and reference material, policy for RM expectations and applications, and oversight quality control by the Safety Manager or additional subject matter experts. This plan requires General Manager approval as the primary responsible individual for overall airport safety.
An incremental implementation phase would involve development of training curriculum and facilitation to all employees, which could be accomplished via traditional training methods in a scheduled classroom setting or via eLearning on electronic devices. This curriculum would cover the basics of the RM process utilizing the Risk Matrix tool in both the strategic planning and on-the-spot settings. The Safety Office is the primary office of program responsibility while Directors, Managers and Supervisors retain oversight of compliance with set policy.

A sustainment strategy involves continuous training (i.e., practical application) for existing and new workforce members and quality control by the Safety Office, or additional subject matter experts. Continuous training can be formal (i.e., periodic refresher) or informal (i.e., opportune involvement by the Safety Office) based on abilities and confidence level related to the task at hand and associated hazards and risk. Additionally, a policy directing the use of RM and in some cases Risk Matrix documentation will ensure comprehensive use of the strategy and tool across all functional areas and phases of operations.

Discussion: The Safety Manager has successfully adopted the use and exploitation of the primary RM tool, the Risk Matrix. It is readily available in the Vortex® SMS software application in use daily by the Safety Manager. Ideally, the use of this tool would be extended to Directors and other Managers to accomplish within strategic planning of responsible programs and projects. The implementation and use of the RM tool at these levels will enable a standardized use of the tool and therefore influence its use and application at lower levels in the workforce. Examples of this are prior to daily operations commencing (i.e., shift brief), prior to unique tasks or scenarios, and/or prior to addressing new or unforeseen hazards present during routine or unique operations.

This job skill will transcend all facets of roles and responsibilities of the workforce from the GM to the least experienced part-time employees. It is a job skill that will also go beyond the workday and into individual's personal lives and activities ensuring RM is as routine off the job as it is on the job.

Finding: Amplifying Safety Strategy Collaboration and Awareness

The Mission of the Truckee Tahoe Airport is "*The Truckee Tahoe Airport aims to provide safe, high-quality services and facilities, reduce impact on airport neighbors and the environment, and invest in opportunities that increase community safety and provide sustained benefit to the entire Truckee Tahoe region."* The airport has consistently over the years taken active steps to meet its mission and responsibilities to the community. This includes community engagement and open feedback loops.

The feedback from the community provided through this year's survey questions, interviews, and historical documents indicates a gap in safety-related information made available for public consumption. Specifically, a validating percentage of survey answers indicate an opportunity to further inform the community of airport safety strategies, programs, and successes. In doing so, awareness and confidence in operations, management, and strategies are then strengthened. Varying strategies of communications and contact points with community members ensures a more comprehensive audience and therefore, wider understanding of the messaged objective (i.e., safety is the priority). This goes beyond open board meetings, community outreach, and engagements. Intentional information and education opportunities of airport operations,

Risk: Low 

Recommendation:
It is recommended to complement the existing airport outreach programs (e.g., ACT, Community Services, Pilot Outreach, etc.) and implement an active educational strategy to enlighten the local community on the airport's safety strategies, programs, and efforts. The ideal educational effort is a consistent low-threshold continuum of shared content to improve the baseline of understanding amongst the community. This can be accomplished through active (i.e., public briefings, presentations) and passive (i.e., web-based) communications on a routine basis.

Analyze and consider the actual tone and areas of concern posed in the survey results when developing informational content intended to educate the community on airport safety efforts. It may also be impactful to publicly communicate safety program achievements relative to operations, community concerns, risk mitigation, mishap response, and unique events and metrics (e.g., annual airshow, safety statistics, etc.).

It has been shown to improve community trust in high-risk operations by communicating an organization's Safety Goals/Objectives and introducing those ultimately responsible for ensuring sound safety and risk mitigation strategies. At a minimum this would include the General Manager and the Safety Manager. This is intended to personalize these overarching and prioritized strategies which have significant impact on the operation and surrounding community. It is not intended to publicize these individuals as primary points of contact for public communications unless already established to do so through policy or process.

Discussion: The safety culture intentionally developed at the Truckee Tahoe Airport over the past five years is to be commended for its influence on operators, tenants, community partners and stakeholders. The next phase of growth in this context will eventually influence the surrounding community to greater degrees and improve trust and support in strategic planning and decisions.

An intentional effort to provide even more transparency on exactly how risk is mitigated across all functional areas and for the community will certainly improve trust and reduce concerns. However, there are apparent localized impediments to this outcome which can be addressed. In observation and through testimony, noise sensitivity is a leading concern and discussion item within the community and at the airport. The extent of efforts dedicated to this issue are impacting safety in a unique way. It is not uncommon to correlate airport noise concerns with airport safety or questions of its impact. However, both topics deserve separate attention and discussion points as aircraft noise issues are not in and of themselves safety issues, unless if and when the related flight operations are characterized as outside safe parameters or regulations.

An intentional collaborative effort involving Safety, Pilot Outreach, and Community Services enables a holistic approach to addressing stakeholders utilizing the most impactful messaging to inform and address those concerns while informing and educating simultaneously.

Finding: Adopting a Just Culture Model

The safety program elements of buy-in, confidence, and open-communication are readily apparent within the safety culture of the Truckee Tahoe Airport. The Survey Data reveals a high level of involvement in safety practices by the workforce in response to the four well-established pillars of the Vortex® SMS. However, there is room for improvement to move the needle of safety culture even further on the scale of success. The next phase of growth in this context is the adoption of a Just Culture Model and its development through policy, process, and practice.

Risk: Low 

Recommendation:
A Just Culture model provides an objective view within a process to determine accountability based on faults, intention, and logical thinking. It is a concept related to systems thinking which emphasizes that mistakes and errors by individuals are generally a product of faulty organizational cultures, rather than solely brought about by the person or persons directly involved. The focus is more about accountability vs. blame and punishment. The catalysts' fault within the organizational culture are normally divided into four categories, 1) Planning, 2) Policy, 3) Training, and 4) Supervision. However, there are scenarios whereby the person or persons involved are responsible for the undesired outcome based on behaviors and attitudes associated with complacency, apathy, and intentional non-compliance.

It is recommended the General Manager adopt a localized version of a Just Culture Model developed through a team approach with functional area representation. A standard model is a great starting point to identify the appropriate lexicon and consequences based on culture, policy, and objectives of leadership and the human resources department. The Safety Office is responsible for codifying the model as an SMS tool, which can be utilized and scaled beyond safety and security to employee performance across the organization.

Discussion: The top influencing variable within an organization's culture is 'trust' between leadership and the workforce. It even goes beyond this operational scope from leadership to stakeholders and the surrounding community. It takes time and intentional efforts to develop and maintain trust within an organization, let alone the relationships within. However, the trust factor can be diluted, or even eliminated with just one or a few actual missteps or the perception of unfair handling of personnel issues. What ensures that all stakeholders feel that safety is considered a top priority at TTAD?

A Just Culture Model introduced into the culture and normal business practices at the Truckee Tahoe Airport would solidify the conduit and bridges of trust already in place. The model ensures those connections remain solid and perceptions match reality when job performance issues or events dictate the use of it. Transparency is always a key element of the Just Culture

Model, and it is recommended to dedicate a select group of individuals to collaboratively exercise the model when required to do so, which in a sense becomes your "Just Culture Team." The established tool becomes an asset to continuous improvement and shaping of the organizational culture regardless of leadership and personnel changeover through the coming years.

Finding: Next Level Safety Promotion

Safety promotion is an important part the Vortex® SMS, setting the tone for the organization, and helping to build a robust safety culture. Safety promotion also helps to foster improved safety performance by communicating lessons learned, broader safety information and the distribution of the safety policy, procedures, and practices in the organization (CASA and FAA). The promotion of safety as a mindset, behavior, and expected outcome is normally approached in many ways. While the TTAD Board, General Manager, Safety Manager, and staff demonstrate true intentions and promotion of safe operations at the airport and surrounding community, there are a few best practices to adopt and further influence all involved in and around the operation.

Risk: Low 

Recommendation:
While safety assurance is the quality control element of an SMS to ensure what was planned is practiced efficiently and effectively, safety promotion is the intentional communication and feedback process supporting the overall quality of the culture. There are always evolving improvement opportunities to consider and implement in support of safety promotion, specifically modes and methods of communication.

It is recommended to consider the following improvements in communication-focused safety promotion:

1. Add a "Safety Office Report" presentation and discussion to the monthly TTAD Board Meeting agenda under the "Management Team Reports" section. Agenda items are logically trend item and priority subject dependent; however, a common practice is to focus on one of the four SMS pillars during each engagement. In a year's time each pillar would therefore be addressed 3x annually.

2. Add the word or term "safety" or "safe operations" respectively, to the Airport Mission statement. While words truly matter in the context of desired organizational behaviors and outcomes, the added impact on the proven mission provides strategic influence on safety. It inserts a primary tool of success which enables the adjacent mission statement outcomes to manifest themselves.

3. Add a web-page tab titles and dedicated to “Safety” on the Truckee Tahoe Airport website. Currently the safety hyperlink is underneath the “Aviation Information” tab and associated with non-strategic and non-critical elements of information.

Discussion:
TTAD has done an exceptional job of establishing a healthy safety culture and supporting safety program with an operational SMS over the past five years. It is clear from the Survey Data that safety is a priority in both reality and perception.
However, there are simple additive practices to embolden the safety culture, safety office, and SMS pillars. Absent the recommend practices above, the safety strategy will continue to operate however, the actual and perceived emphasis on this primary tool of operational success becomes diluted over time and obsolete to a degree. How can TTAD help make those affiliated feel that safety is a default as opposed to an additional thought?

Finding: Inclusion of Human Factors Analysis and Applications

Human Factors are those variables within processes involving humans interfacing with machines within an environment which accounts for a safe performance to a standard level of effectiveness. It also accounts for human failure in the context of mistakes and errors impeding success and, in some cases, enabling tragedy. The goal of Human Factors is to reduce human error, increase productivity, and enhance safety and comfort with a specific focus on the interaction between the human and the element of interest.

Currently, the safety strategy and relevant processes do not formally include Human Factors as a training topic, focus of analysis, or identified hazard within the Risk Management (RM) pillar of the Vortex® Safety Management System.

Risk: Low 

Recommendation:
It is recommended to add the adoption of a Human Factors promotion effort into all aspects of the Safety Office strategies and overall organization’s focus on continuous improvement. While there are numerous human factors to focus on, it is recommended to begin with a small group to implement across the organization. This group of Human Factors is chosen out of the vast list due to their common occurrence in high-risk operations, their ease of mitigation, and a baseline of understanding enabling expansive strategies into those remaining on the list.

The human Factors to initially focus on are:

- Fatigue
- Distraction
- Complacency
- Non-compliance (AKA Norms)

This focus involves the following:

- Inclusion of all four pillars in each Vortex® SMS report-based investigation
- Strategic communication from airport leadership including one, some, or all four factors in the context of whatever message is being conveyed
- Training through any method or mode in order to educate the workforce on each factor including its definition, impacts on performance, and mitigation strategies and techniques

Discussion:

The purpose of root cause analysis (RCA) is to identify the specific catalyst initiating or primarily enabling a chain of events leading to an undesired outcome. Whether informally (i.e., production and problem-solving discussions) or formally (e.g., using Vortex® SMS), the Safety Manager and airport staff have the opportunity to grow into the next level of safety management with the inclusion of these four human factors into daily operations, communications, and analysis of outcomes.

When addressed in RCA, a true qualitative focus on points of personnel failure (and success), the human performance levels logically improve with fewer setbacks and complimentary levels of efficiencies and precision. Learned lessons from undesired outcomes tend to focus on "what" happened and "how" something happened to prevent future occurrences. The inclusion of human factors identifies the "why" a certain outcome occurred and enables direct mitigation through training, processes, and/or performance.

Human Factors can manifest as both capabilities and limitations. Factors of humans include, for example:

- Cognitive functions (such as attention, detection, perception, memory, judgement, and reasoning (including heuristics and biases), decision making – each of these is further divided into sub-categories)
- Cognitive systems (such as Kahneman's dual process theory, or System 1 and System 2)
- Types of performance (such as Rasmussen's skill-based, rule-based, and knowledge-based performance)
- Error types (such as Reason's slips, lapses, and mistakes, and hundreds of other taxonomies, including an individual's)
- Physical functions and qualities (such as strength, speed, accuracy, balance, and reach)
- Behaviors and skills (such as situation awareness, decision making, teamwork, and other 'non-technical skills')
- Learning domains (such as Bloom's learning taxonomy)
- Physical, cognitive, and emotional states (such as stress and fatigue)

Finding: Next Level Safety Assurance

One of the four Safety Management System (SMS) pillars is specifically titled, "Policy and Objectives" which focuses on qualifiers of safe operations involving strategies, planning, resourcing, and compliance with policy, directives, regulation, and law. It is developed and distributed from the highest level of an organization (e.g., General Manager).

The current safety policy memorandum at the Truckee Tahoe Airport is published for employee and stakeholder access through the Injury, Illness, and Prevention Program (IIPP), dated Jan 2021. The TTAD Handbook, dated May 2020, contains a section on safety and subsequently the elements of a safety policy document. The content in the handbook is comprehensive and provides a solid understanding for the reader what is expected and how safety is to be utilized at the airport.

Risk: Low 

Recommendation:
The primary pillar of the SMS is manifested through organizational attitudes and actions towards safety based on the language and emphasis provided in an annual safety policy memorandum.

It is recommended to publish an annual Safety Policy memorandum which summarizes General Manager expectations relevant to safety culture, strategies, and performance expectations. The memorandum may reference additional supporting documents with greater detail such as the TTAD Handbook, Section 5 and the IIPP software tool. This memorandum should be renewed and published on an annual basis to ensure assimilation with strategic, operational, and cultural growth. Its distribution should involve an aggressive communication method to ensure all employees, operators, tenants, and stakeholders receive the document and can review and implement it.

Discussion:

- The Safety Policy should emphasize the airport's safety values, commitments, and resources. In ICAO's document 9859, it is written that your airport's Safety Policy is intended to, "describe the organization's intentions, management principles and commitment to improving aviation safety in terms of the…service provider."

- Promoting TTAD's aviation SMS Safety Policy is an extremely important way of ensuring that employees:
    - Know key safety information (i.e., Objectives, RM).
    - Understand what the airport values; and
    - Know their role in the SMS.

TTAD's safety policy is the catalyst of all programs, tools, and techniques to identify hazards, manage risk, and promote continuous improvement.

Findings of Other Significance

Finding: Security within Safety Management

The current alignment of Airport Safety and Security roles and responsibilities under the Safety Office is not unique and in certain environments a best-practice. While it can create a burden of workload and task management based on personnel numbers and General Manager priorities, the two functional areas a clearly overlapping and in some cases synchronous.

At the strategic level, security is a function of an overall safety umbrella just as Risk Management (RM) is within the Safety Management System (SMS). By definition:

- *security* is the quality or state of being secure from existential threats against personnel, infrastructure, IT, and less tangible aspects such as image and brand. It enables the protection of those assets.
- *safety* is the strategy and resulting condition of being protected from known and unknown danger, risk, hazards, which left unmanaged can lead to damage, injury, or worse. It enables an atmosphere of feeling safe and protected.

The Vortex® SMS report history indicates a growing trend in security violations specific to unauthorized personnel gaining access to the airport property and controlled movement area. Even though the airport is not classified as a Part-139 airport by FAA standards requiring certain robust security provisions (i.e., perimeter fencing), the threat is the same. Unauthorized personnel on the airport property pose a security hazard, and therefore a safety risk to the overall operation.

Risk: Medium 

CONCLUSION

This 5-Year Gap Analysis and Safety Assessment has provided a current state of the airport's safety culture while identifying areas of continuous program growth since 2015 and other areas requiring attention. Those latter areas are mostly due to the maturing effect of a health safety program led by an extremely competent and involved Safety Manager collaborating with equally competent and involved Department Directors.

The airport Mission Statement provides the answer to the question, "What does the airport do?" The TTAD Employee Culture and Core Values provide the "Why" to that mission statement. It is clear safety is a priority amongst the TTAD Board, General Manager, and Department Directors, which easily transfers to the employees and stakeholders.

This positive assessment enables the opportunity to migrate the safety program to the "next level of SMS."

The key to success will require three specific actions by the airport management team and TTAD Board.

1. First, an action plan with timelines, roles, and responsibilities should be created at the earliest opportunity based on internal evaluations and adoption of all or some of the Findings and Recommendations.
2. Second, the program must be resourced and widely communicated to ensure the most effective engagement and collaboration by all entities involved.
3. Finally, the management team must continue to strategically plan for the future relative to increased operations and type, added technology and procedures, resource requirements, and most importantly mentoring the next generation of Supervisors, Managers, and Directors.

Falcon16 Solutions thanks the Safety Manager, Department Directors, General Manager, and TTAD Board for the opportunity to provide this gap analysis and assess the overall safety health of the Truckee Tahoe Airport. We look forward to continuous consultation over the next ten months to continue the next phase of this remarkable strategy.

Please feel free to contact us at any time regarding this analysis and report, or any other safety-related question or desired discussion. We look forward to it!

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APPENDICES

Appendix 01 – Quick Reference List of SME Observations, Findings and Recommendations

This table is meant to be a note-taking reference to catalogue your thoughts and ideas regarding our observations, findings, and recommendations. Greater detail is provided in the **SME Observations** and **Major Findings and Recommendations** sections.

SME Observation/Finding	Recommendation

Appendix 02 – Gap Analysis Strategic Planning Schedule

This schedule will help you create a timetable to create and implement your Gap Analysis program.

Table 1 – Gap Analysis Strategic Planning Schedule (sample)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Focus Area		5		6		1		2		3		4
S.A.	X		X		X		X		X		X	
S.I.		X				X				X		
Gap Analysis					X							

S.A. – Self Assessment S.I. – Self Inspection

Focus Areas (example)

1. ATC Tower and UNICOM Procedures Review and Training
2. Leased Hangars
3. Snow Removal Training and Operations
4. Local Airspace and Procedures
5. SMS and Risk Management Program(s)
6. Aircraft, parachute, and glider operations

Appendix 03 – Functional In-Depth Review

The Gap Analysis Tool of Excellence (G.A.T.E.) is a unique comprehensive tool intended to address compliance with Regulatory Guidance, Local Policy, Stakeholder Requirements, and Industry Best-Practices. The observations are listed in the right-hand column and if blank, issues were not observed or noted through review.

Each row in the tool contains a reference number (i.e., Ref #) used to identify each line item. The Requirement column describes and/or defines the source information and agency directing the requirement. The Compliance column utilizes a binary "yes" or "no" option for each requirement. The Tier column is used to annotate the degree of risk associated with the requirement, whether in compliance or not. The three tiers are I – high risk, II – medium risk, III – low risk.

The completed G.A.T.E. has been provided to the Safety Manager and is available for access or distribution from that office.

Table 2 – Gap Analysis Tool of Excellence (example)

Ref #.	Requirement	Comply Y	N	Tier	References / Comments / Evidence of Non-Conformities
1.0.1.	Management has established a strategy to ensure Directors and functional managers and supervisors (rather than only safety staff) take all available actions to mitigate hazards and reduce risk while incorporating all airport customers and shareholders in the effort to accept no unnecessary risk(s).	X		II	Note: This conformity evaluation should be completed ONLY after all subsections.

Appendix 04 – Interview Questions

A common set of questions was used for each interview and changed slightly based on individual's role, area of responsibility, and experience.

Questions

1. In one sentence, tell me what you believe to be the safety philosophy here.
2. On a scale of 1-10 where 1 = non-existent and 10 = outstanding, how do you qualify the safety culture at the Truckee Tahoe Airport?
3. How familiar are you with Risk Management, and do you use it routinely (defined as >2x per week)?
4. How often do witness acts of non-compliance with regards to local policies or procedures?
5. What do you believe has improved the safety culture at the airport the most over the last year? Last 3-5 years?
6. What do you interpret your role to be in the airport General Manger's safety strategy?
7. Are you aware of the Vortex® SMS program managed by the Safety Manager?
8. Do you feel comfortable reporting hazards or unmanaged risk to the Safety Manger or through Vortex®?
9. If you were the "boss" for a day, what would you change in terms of safety?
10. What is the greatest threat to safe operations at the airport?

Appendix 05 – G.A.T.E. Findings Management Tool

The identified non-compliance annotations (AKA Findings) and/or areas of concern in the Gap Analysis Tool of Excellence (G.A.T.E) are intended to be prioritized, managed, and resolved by the Safety Office or appropriate office of responsibility. The table below is a recommended tool for accomplishing this strategy. However, a similar administrative strategy could be accomplished utilizing the Vortex® SMS application and software.

Table 3 – Recommendation Tracking Table

Finding No.	Tier Level	Description	Guidance Reference (If required)	Open Date *	Recommended Action	OPR	Closed Date **
99 (example)	**III**	**Smoking while refueling aircraft and/or vehicles and/or equipment**	**OSHA x.y.z. FAA AC x.x**	**5/29/15**	**Set policy forbidding smoking while refueling. Produce warning signs.**	**Safety Office**	**x/xx/xx**

* Date official report is received by General Manager, Safety Manager, and appropriate Director.

** Date the recommended action is complete or finding is satisfied or deemed non-applicable by management.

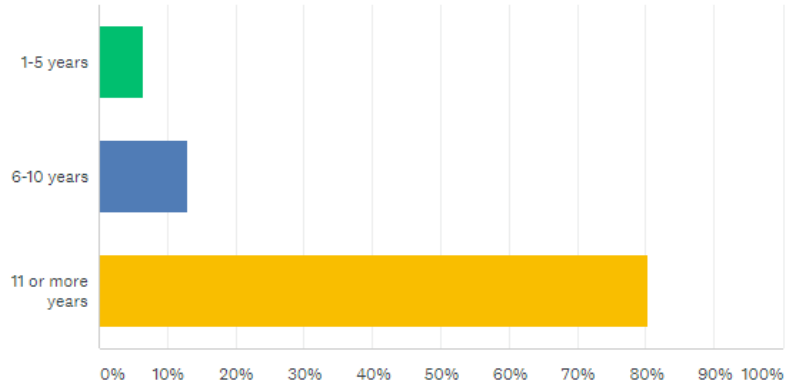
OPR – Office of primary responsibility

Appendix 06 – TTAD Board, Stakeholders, Public Survey Data

Survey Group 1: TTAD Board, Stakeholders, and Public
Responses: 47
Completion Rate: 100%
Average time: 5 minutes, 30 Seconds
Most-skipped Question: #1

Question 1 - How long have you been associated with TTAD as a Board member (present or past), a stakeholder, and/or community member?

Summary Analysis – This question is designed to understand the demographic of those surveyed relative to time in years of experience and exposure to the airport. It is noted that 80% of those who responded to the survey request have greater than eleven years. Recommend assessing the comments associated with this question to identify possible amplifying or impactful commentary.



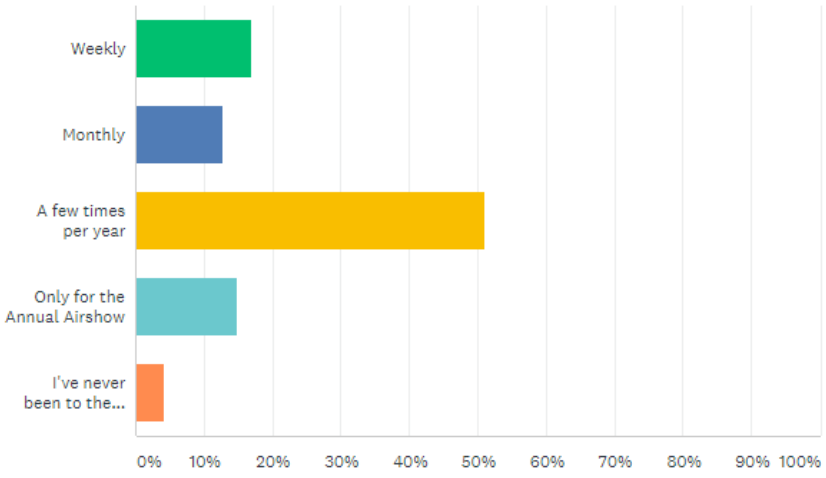
ANSWER CHOICES	RESPONSES	
1-5 years	6.52%	3
6-10 years	13.04%	6
11 or more years	80.43%	37
TOTAL		46

Comments (20)

Question 2 - **How often do you visit the airport?**

Summary Analysis – This question is designed to understand the familiarity and proximal experience with physical presence at the airport. This is important because a web page, word of mouth, social communications, and conjecture do not account for the scope and scale of the operation. The airport offers a significant amount of engagement opportunities for visitors not associated with flight operations or airport business matters.

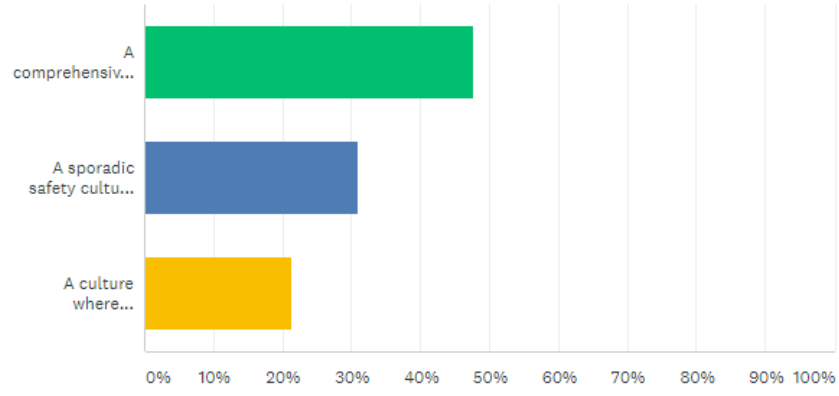
It is recommended to continue creating both real and virtual opportunities for community members to experience what the airport has to offer for visitors and in collaborative engagements with the surrounding communities.



ANSWER CHOICES	RESPONSES	
Weekly	17.02%	8
Monthly	12.77%	6
A few times per year	51.06%	24
Only for the Annual Airshow	14.89%	7
I've never been to the airport	4.26%	2
TOTAL		47

Question 3 - What is your opinion of the safety culture at TTAD?

Summary Analysis – This question allows for an assessment of the safety culture by a demographic that primarily resides as a customer or recipient of the services provided by the airport and its tenants. A deeper analysis is required by the General Manager and Staff in conjunction with a review of the provided commentary.
This data contrasts with what is perceived and/or believed by the airport employee group and operators and tenants. It is possible that traditional topics of concern (i.e., noise annoyance) by the community have influenced the relative skewed results (>52% negative reply) regarding safety culture.



ANSWER CHOICES	RESPONSES	
A comprehensive safety culture	47.62%	20
A sporadic safety culture varying between good and bad	30.95%	13
A culture where operations and business are more important than safety	21.43%	9
TOTAL		42

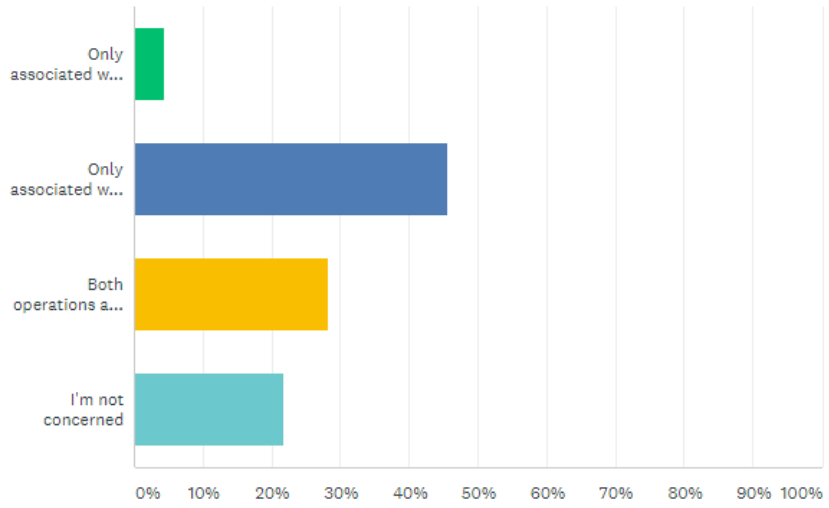
Comments (20)

Question 4 - If you have concerns about safety and safe operations at TTAD, what are they related to?

Summary Analysis – This question and resulting data provide for targeted strategic communications with outreach efforts to address community safety concerns. It is logical to see data results indicating differing concerns with aviation safety based on the geographical focus of the risks and hazards involved.

While there is no positive or negative data set involved, the nearly 22% of respondents not concerned with safety is a higher-than-expected results.

Recommend assessing the comments associated with this question to identify possible amplifying or impactful commentary.



ANSWER CHOICES	RESPONSES	
Only associated with operations at the airport	4.35%	2
Only associated with operations above and around the surrounding community	45.65%	21
Both operations at the airport and above and around the surrounding community	28.26%	13
I'm not concerned	21.74%	10
TOTAL		46

Comments (17)

Question 5 - To what degree, if at all, are the following a threat to your safety or that of the community.

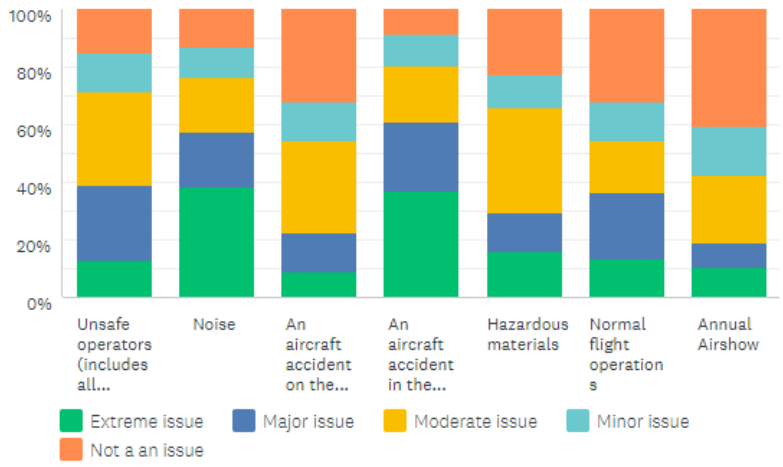
Summary Analysis – The question and resulting data set provide a significant amount of analysis opportunity. At a minimum, it provides for targeted strategic communications with outreach efforts to address community safety concerns.

Two of the data sets present unique perspectives relative to actual vs perceived threats of safety. First, the 37% of respondents who identify an "accident in the community" as an extreme issue is a logical result and remarkably carries the highest weighted answer. Second, the >38% of respondents who identify "noise" as an extreme issue is not a logical result yet carries the 2nd highest weighted answer.

Aircraft noise and its related annoyance at and near airports of all sizes is consistently an issue to be addressed and resolved to the maximum extent possible for all parties involved. It should always be addressed with an understanding of both sides of the issue - the airport and the community.

However, the issue of noise annoyance with airport operations experienced by the community should not automatically be associated with aviation safety. **Aircraft noise is not an operational safety issue**, unless the noise annoyance is present due to unsafe or non-traditional types of operations (i.e., unapproved flight paths) or flight parameters (i.e., low-flying below minimum altitudes). These and other like-acts of noncompliance or flight discipline events should always be investigated as safety issues and addressed by designated safety personnel. It is noted that noise annoyance can impact the health of those most affected by it.

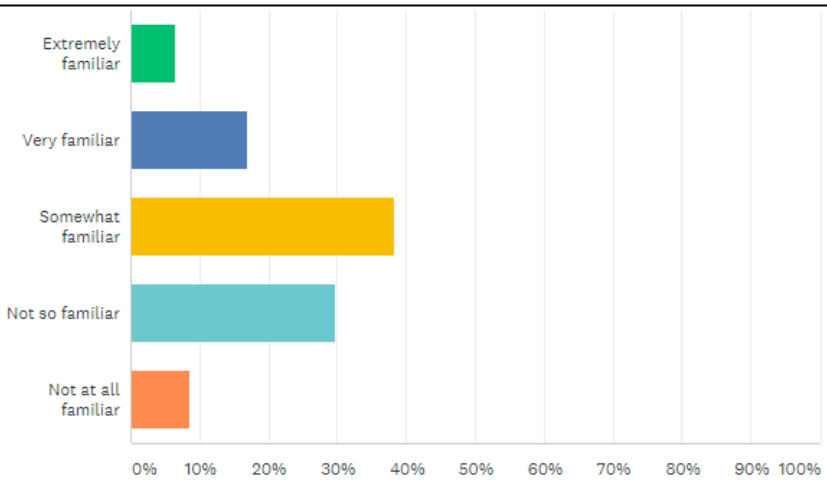
The unfortunate but common alignment of noise annoyance as a "safety" issue detracts from both areas of concern. It is recommended to establish a strategic communication effort focused on delineating these two issues to allow clear discussions regarding topics of mitigation, accommodation, and understanding root cause concerns and operational requirements of turbo and jet powered aircraft.



	EXTREME ISSUE	MAJOR ISSUE	MODERATE ISSUE	MINOR ISSUE	NOT A AN ISSUE	TOTAL	WEIGHTED AVERAGE
Unsafe operators (includes all aircraft types and parachutests)	13.04% 6	26.09% 12	32.61% 15	13.04% 6	15.22% 7	46	3.09
Noise	38.30% 18	19.15% 9	19.15% 9	10.64% 5	12.77% 6	47	3.60
An aircraft accident on the airport	9.09% 4	13.64% 6	31.82% 14	13.64% 6	31.82% 14	44	2.55
An aircraft accident in the community	36.96% 17	23.91% 11	19.57% 9	10.87% 5	8.70% 4	46	3.70
Hazardous materials	15.91% 7	13.64% 6	36.36% 16	11.36% 5	22.73% 10	44	2.89
Normal flight operations	13.64% 6	22.73% 10	18.18% 8	13.64% 6	31.82% 14	44	2.73
Annual Airshow	10.64% 5	8.51% 4	23.40% 11	17.02% 8	40.43% 19	47	2.32

Question 6 - I am familiar with the strategies emphasizing safety and safe operations at the airport.

Summary Analysis – This question addresses the passive and active efforts to inform the community on safety strategies and parameters of safe operations at the airport. It is incredibly positive that 57% of respondents are familiar with this element of airport operations. A target of improvement should focus on increasing that familiarity through information campaigns and leveraging unique opportunities (i.e., annual airshow).

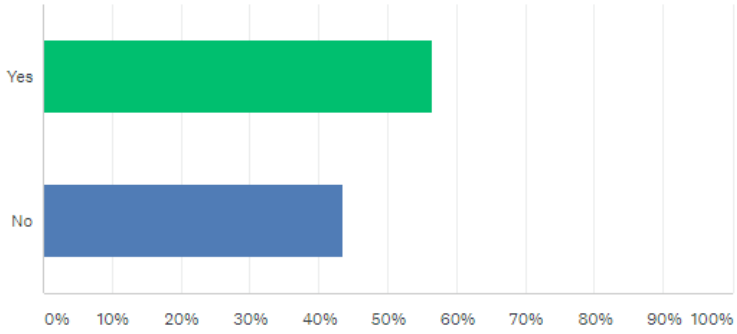


ANSWER CHOICES	RESPONSES	
Extremely familiar	6.38%	3
Very familiar	17.02%	8
Somewhat familiar	38.30%	18
Not so familiar	29.79%	14
Not at all familiar	8.51%	4
TOTAL		47

Comments (4)

Question 7 - I am familiar with the Management positions and their responsibilities at the airport.

Summary Analysis – The results of this survey question provide a snap-shot assessment of those responsible for airport operations. A target of improvement should focus on increasing that familiarity through information campaigns (i.e., web page, outreach, etc.) and leveraging unique opportunities (i.e., annual airshow, tours, etc.).

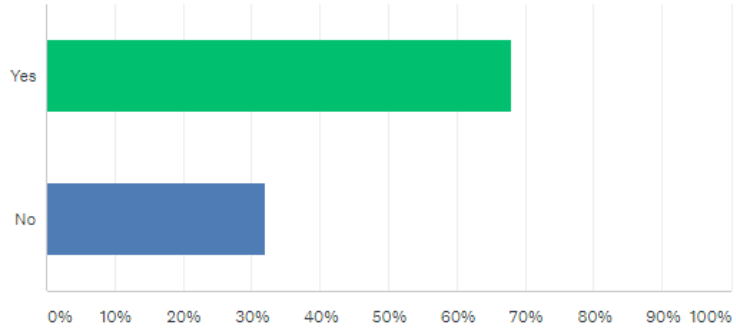


ANSWER CHOICES	RESPONSES	
Yes	56.52%	26
No	43.48%	20
TOTAL		46

Comments (3)

Question 8 - I have communicated concerns to TTAD in the past regarding unsafe operations or hazards.

Summary Analysis – This question qualifies the transparency and access aspects of the airport and the management team. The nearly 70% of respondents answering "yes" indicates a willingness and the initiative to communicate safety concerns. A deeper analysis is required by the General Manager and Staff in conjunction with a review of the provided commentary.
It is recommended to identify and understand the methods and modes of communication used to voice these concerns. This will enable greater efficiencies and effectiveness with these types of communications to resolve concerns or address unsafe operations in a timely manner.

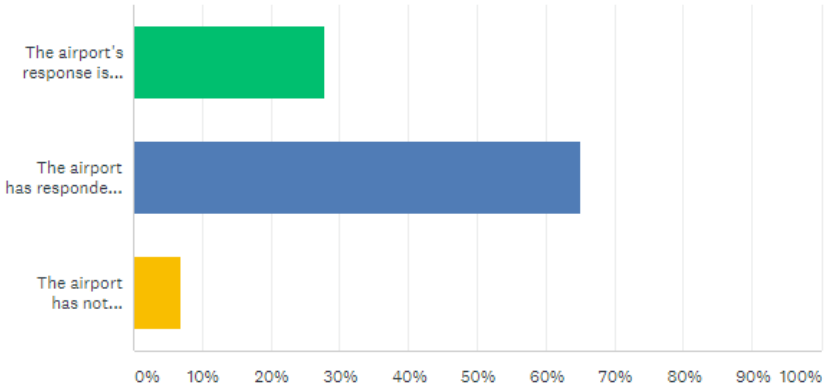


ANSWER CHOICES	RESPONSES	
Yes	68.09%	32
No	31.91%	15
TOTAL		47

Comments (15)

Question 9 - Regarding community safety concerns, I believe …

Summary Analysis – The results from this question are extremely positive considering >93% of respondents believe their voice was heard and some degree of action was taken. A key element to analyze based on the provided commentary and local knowledge is whether a consistent feedback loop exists. Those responding that "more could be done" either 1) did not have an opportunity to provide their opinion or idea through reporting mechanisms, or 2) were not informed what actions, if any, were taken in response wot their concerns. Additional information for this data analysis is available in question 10 results.

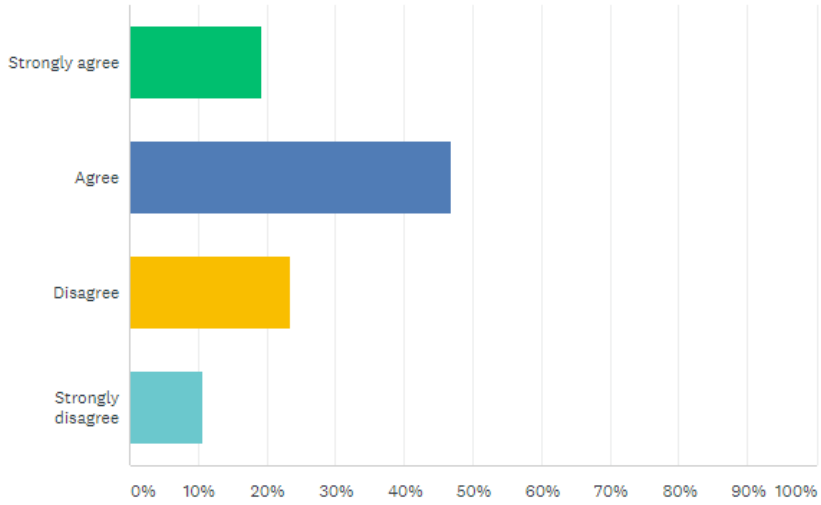


ANSWER CHOICES	RESPONSES	
The airport's response is just right	27.91%	12
The airport has responded but more could be done	65.12%	28
The airport has not responded	6.98%	3
TOTAL		43

Comments (12)

Question 10 - The airport Management and staff listen to community inputs and concerns and provide feedback on resolutions.

Summary Analysis – The results of this survey question clearly identify two groups relative to the basis of the question and relate directly to the results in question 9. Communications with the community stakeholders is always an evolving strategy to satisfy existing and new concerns. An established feedback process pays dividends with community trust regardless of the resolution to inputs and concerns.



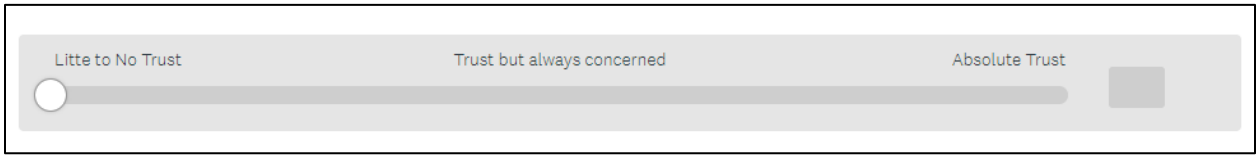
ANSWER CHOICES	RESPONSES	
Strongly agree	19.15%	9
Agree	46.81%	22
Disagree	23.40%	11
Strongly disagree	10.64%	5
TOTAL		47

Comments (13)

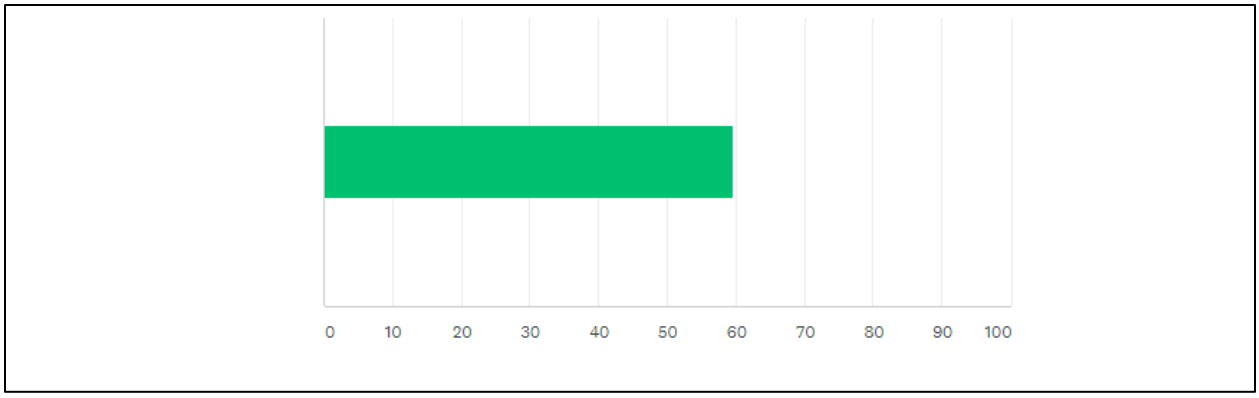
Question 11 - My level of trust in the airport management and staff to ensure safe operations and safety for the community are …

Summary Analysis – This question is designed to provide a baseline and barometer of the trust factor between the community and airport management and staff. That trust can be gained and maintained through several strategies and practices and must be intentional. Of note, the results are not a percentage of those who trust the airport management and staff, but a quantifiable measurement indicating trust exists with concerns for safety.

Recommend using this question in future surveys to assess the progression or regression from this data point. A target of improvement should be a measurable increase in this trust factor over time. Look to identify what strategies and practices influence or impact that change the most.



*Answer option as seen by the survey participant.



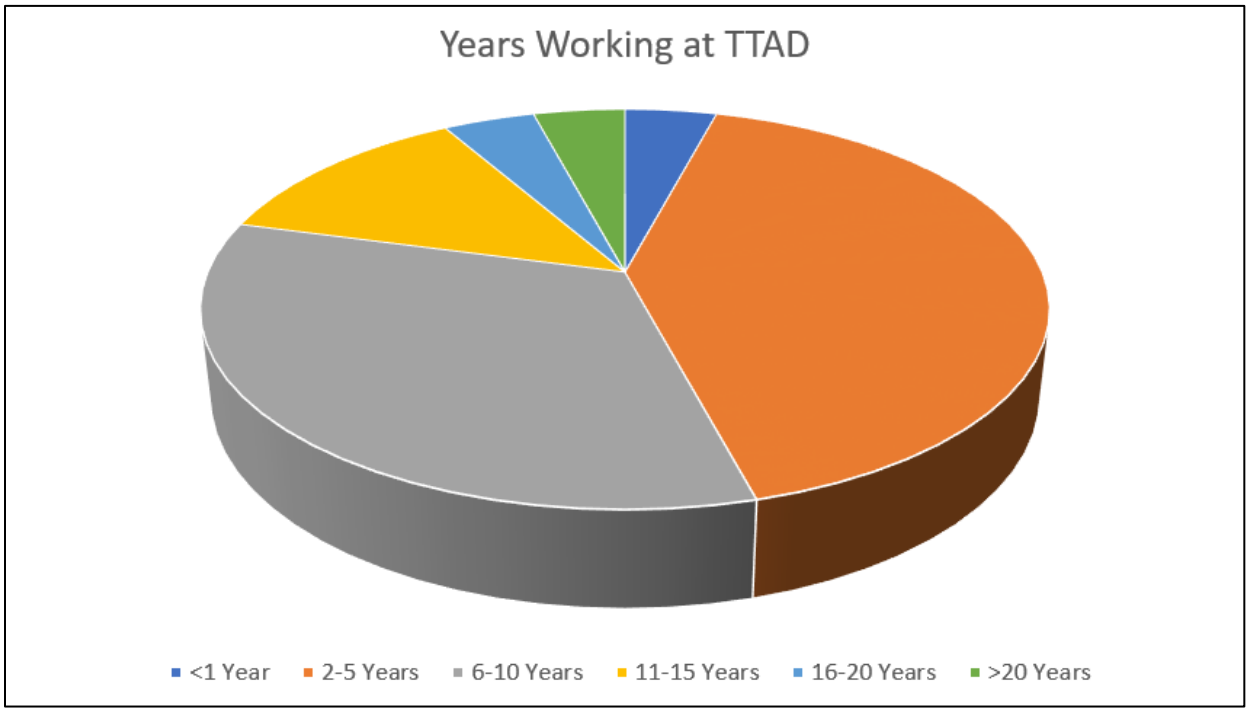
Appendix 07 – Employee Survey Data

Survey Group 2: Airport Employees
Responses: 24
Completion Rate: 100%
Average time: 4 minutes, 52 seconds
Most-skipped Question: #10

Question 1 - How long have you been an employee with the Truckee Tahoe Airport? Please answer in years and months (e.g., 5 years 7 months).

Summary Analysis – Based on the demographic of airport employment time in years and months, there is clearly a broader representation of 2 to 10 years. When the year groups are filtered against the remaining survey questions, it is apparent the younger age groups have a relatively more positive and engaging attitude towards safety than the older age groups. Of note, the older groups do have a positive and engaging attitude towards safety however, it is likely more influenced by years of experience and adopted norms within a working culture not as exposed to safety as they currently are.

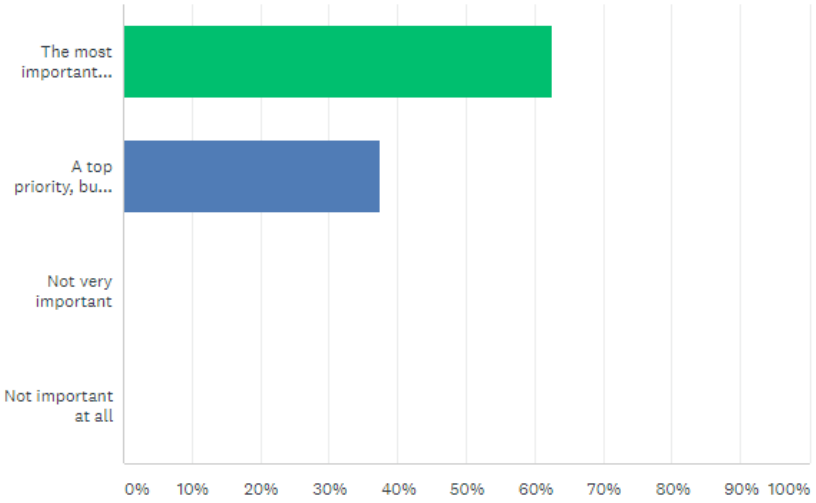
This survey question should be used in future surveys to monitor the aging work force and the related evolving attitudes towards safety.



Question 2 - How dedicated do you perceive your fellow TTAD employees to be toward safety, regardless of where they work?

Summary Analysis – This question highlights subjective perspective of co-workers' attitudes and behaviors toward safety. It could be a culmination of multiple experiences, a single (or limited) experience, or an influential yet limited deviation from normal behavior(s). Regardless, 100% of those surveyed assessed those attitudes and behaviors as "the most important priority" or "a top priority" of co-workers. Absent amplifying data, it is not possible to decipher the cause or contributing factors of the 37.5% who chose the second option. It is possible to assess that over one-third of the employee group perceive co-workers who have at least once if not more often prioritized other operational pressures over safety. This result provides a target of improvement for management, specifically the attitudinal reference and resulting behaviors that do not align with the value put on safety at the airport as the top priority.

This survey question should be used in future surveys to monitor allowable trends towards the first answer or otherwise.

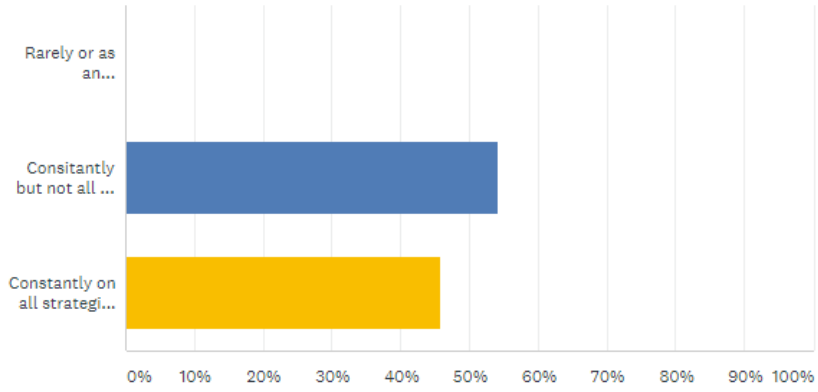


ANSWER CHOICES	RESPONSES	
The most important priority	62.50%	15
A top priority, but not the most important	37.50%	9
Not very important	0.00%	0
Not important at all	0.00%	0
TOTAL		24

Comments (0)

Question 3 - I believe the TTAD Board and Airport Management prioritizes safety when considering strategic plans and making decisions.

Summary Analysis – This question highlights subjective perspective of decision-makers' intentions towards safety. This is most likely a cumulative opinion based on numerous experiences of observation with strategic plans and decision making. The results are incredibly positive considering zero responses were aligned with the "rarely" option. It is important to consider the "consistently but not all the time" selection by over half of those surveyed. This perception of inconsistency can over time erode the *trust* the employee group has in the decision-makers to prioritize safety. This is but one of many safety layers in place to ensure risk is mitigated however, it is one of the more influential variables on the employee group's willingness to work effectively and efficiently.
This question should be drawn out to a deeper level of understanding on future surveys by asking for commentary with the first two options.

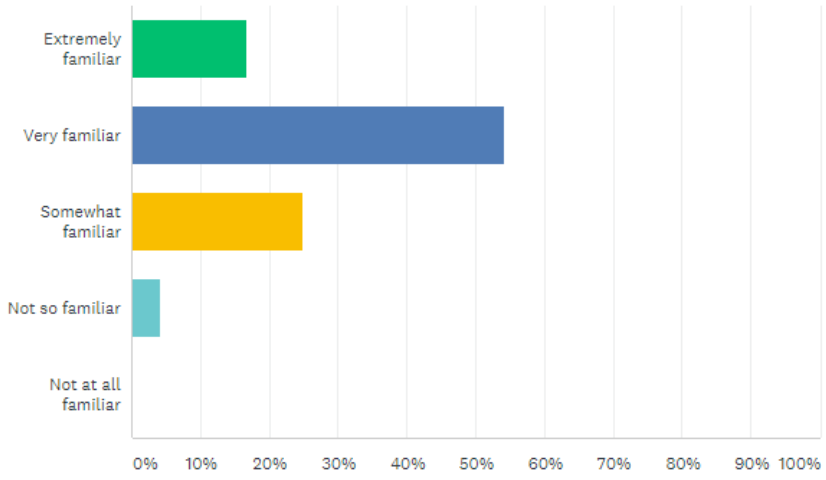


ANSWER CHOICES	RESPONSES	
Rarely or as an after-thought	0.00%	0
Consitantly but not all of the time	54.17%	13
Constantly on all strategies and decisions	45.83%	11
TOTAL		24

Question 4 - I am familiar with our Safety Management System (SMS) called Vortex used by the Safety Staff.

Summary Analysis – The results of this question indicate the Safety Manager has accomplished a lot regarding exposure to the SMS reporting system and the employee group's interface with the system. Although the question did not define the term "familiar" it is a reliable qualification regarding certain employee expectations of engagement with the Vortex® SMS. Any responses indicating a less-than familiar status may indicate a unique employee issue, or the need to reassess the related training program.

This question combined with question 5 indicates a healthy SMS whereby a strong majority of the employee group are familiar with AND participate in the reporting functions.

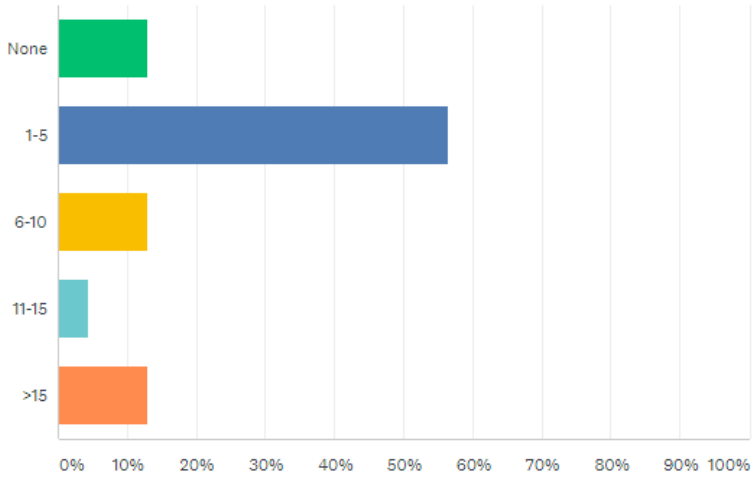


ANSWER CHOICES	RESPONSES	
Extremely familiar	16.67%	4
Very familiar	54.17%	13
Somewhat familiar	25.00%	6
Not so familiar	4.17%	1
Not at all familiar	0.00%	0
TOTAL		24

Question 5 - How many safety reports have you made in the Vortex SMS program since 2016?

Summary Analysis – This question was designed to provide a snapshot view of SMS reporting participation. Since it includes a 5-year span of time, it is difficult to quantify a participation rate. It is a positive result that 80% of those surveyed have at one point submitted a safety report in the last five years. These results enable a benchmark value to improve from whether it is qualified as individual participation over time (i.e., 1 per month) or a cumulative increase in reports over time (i.e., % increase monthly, quarterly, annually).

This question combined with question 4 indicates a healthy SMS whereby a strong majority of the employee group are familiar with AND participate in the reporting functions. A more comprehensive approach from the General Manager and Directors in parallel with the Safety Manager will likely increase SMS reporting participation across all airport functional areas.



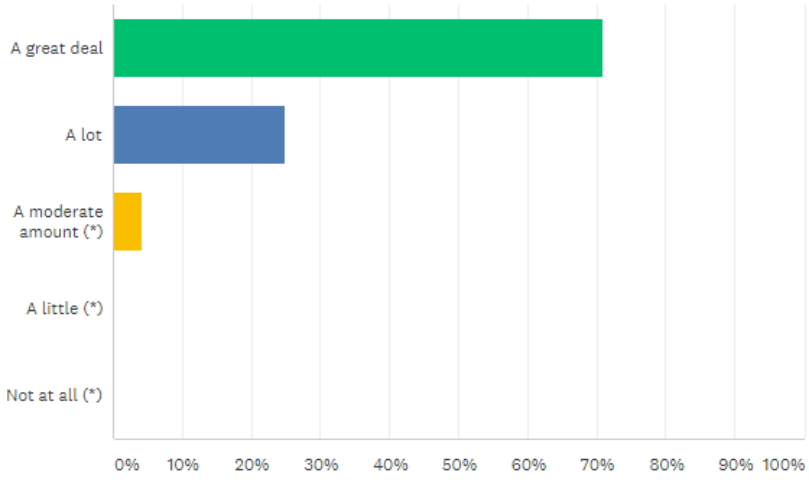
ANSWER CHOICES	RESPONSES	
None	13.04%	3
1-5	56.52%	13
6-10	13.04%	3
11-15	4.35%	1
>15	13.04%	3
TOTAL		23

Comments (1)

Question 6 - I feel safe doing my job at the Truckee Tahoe Airport.

Summary Analysis – This question and subsequent results get right to the heart of Maslow's Hierarchy. Any answers at or above a "moderate amount" are a win for the culture of the airport and those responsible for cultivating it. A feeling of "safe" goes beyond the 10' circle of influence most employees are locked into. It represents a trust in the team concept of safety and the overall environment of processes, procedures, and players of all kinds to include visitors not necessarily familiar with the rhythm of operations and flow of the support side of business. These results are to be celebrated as a win for the safety culture and engagement from the Safety Manager to the General Manager.

This survey question should be used in future surveys to continuously assess the perception of feeling safe in the working environment.



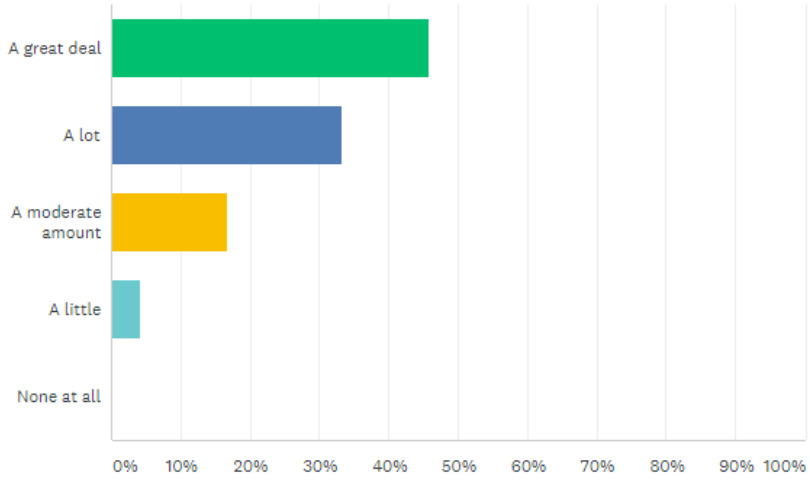
ANSWER CHOICES	RESPONSES	
A great deal	70.83%	17
A lot	25.00%	6
A moderate amount (*)	4.17%	1
A little (*)	0.00%	0
Not at all (*)	0.00%	0
TOTAL		24

Comments (1)

Question 7 - There is regular exchange about safety related issues between employees and management.

Summary Analysis – A key to successful hazard identification and risk management within an SMS is communication. The concept of two-way communication must be practiced and not just pronounced as an objective or even a value. Other than the executive responsibility of safety laid upon the General Manager, there really is no hierarchy of safety. The responsibility lays at everyone's feet creating a mindset that correlates to decisions and resulting behaviors. These results indicate an overt effort by management to address safety proactively and reactively with the employees and enable a culture of trust. A target of improvement should focus on a greater percentage of employees perceiving this rate of exchange as a "great deal" and "a lot" while eliminating the perceived minimal rates of exchange.

This survey question should be addressed by Directors to their specific functional areas of responsibility and the related employees. There are many techniques to ensure a systematic and regular exchange of safety related issues.

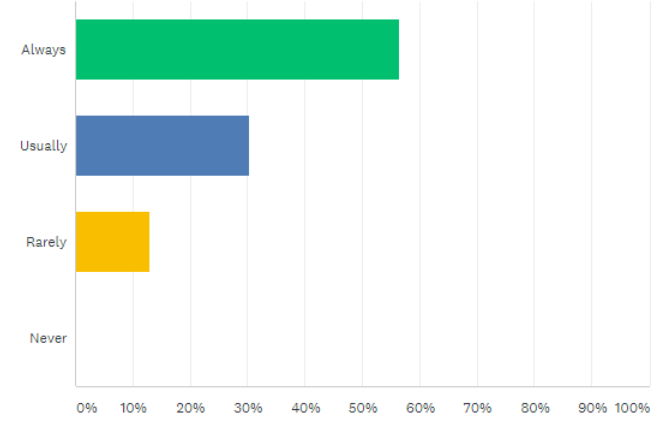


ANSWER CHOICES	RESPONSES	
A great deal	45.83%	11
A lot	33.33%	8
A moderate amount	16.67%	4
A little	4.17%	1
None at all	0.00%	0
TOTAL		24

Question 8 - All safety incidents are investigated quickly in order to improve safety at the workplace as soon as possible.

Summary Analysis – The results of this question are not unusual considering the recent establishment of the Vortex® SMS over the last five years. Also, the continual improvement processes behind the SMS reporting workflow will move this barometer of responsiveness to the 'right'. The Safety Manager has done a tremendous job of establishing a workflow of safety reports to this point and will benefit from greater engagement by Directors in the report workflow process.

While 87% of those surveyed had a very positive response to this question, the remaining 13% should be noted. There is not enough anecdotal information to identity the cause or contributing factors of their negative response. However, the act of reporting safety information must be rewarded with two primary response elements, 1) a closed-loop communication ensuring feedback to the reporter, regardless of the outcome, and 2) a grateful attitude for the contribution to the overall safety of the operation. Absent those two basic elements the trust factor in the SMS is susceptible to eroding and reporting frequency can suffer. In the world of safety, if a hazard is not reported then it essentially does not exist until it becomes an active (vs latent) threat to safety operations.

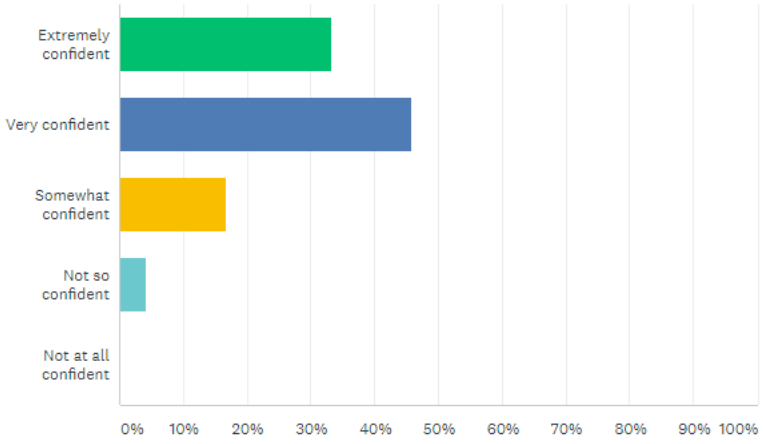


ANSWER CHOICES	RESPONSES	
Always	56.52%	13
Usually	30.43%	7
Rarely	13.04%	3
Never	0.00%	0
TOTAL		23

Comments (4)

Question 9 - I understand Risk Management as a safety tool and am confident using it during routine duties in my role at the airport.

Summary Analysis – The airport safety strategy is ready for "next level SMS" based on these results and those from interviews and observations. A high rate (95%) of confidence in the comprehension of managing and therefore mitigating risk is the essential step to adopting the Risk Matrix as a common tool. This applies to planning and performing routine duties, as well as unique operations posing unique risks. These results are an indicator that Safety Office training is having an impact on both the knowledge base and attitudinal reference of safety amongst employees. The intentional and continuous communications from the General Manager and Directors is also being heard. A target of improvement should focus on a greater percentage of employees feeling "very" or "extremely" confident using one of the most important tools available.



ANSWER CHOICES	RESPONSES	
Extremely confident	33.33%	8
Very confident	45.83%	11
Somewhat confident	16.67%	4
Not so confident	4.17%	1
Not at all confident	0.00%	0
TOTAL		24

Question 10 - Give us your ideas. What could your Safety Staff or Management do to increase safety in your workplace or workspace at the airport?

Summary Analysis – The written commentary results available in Appendix A are worthy of consideration for evaluation and adoption to varying degrees. While the General Manager and Safety Manager address safety from a strategic perspective most of the time, the workforce sees first-hand the application of those strategies. Some applications pay dividends towards safer operations while others fall short for various reasons. However, those that fall short are not readily visible at the management level until a close call or event occurs highlight the mismanaged risk.
The practice of soliciting direct feedback and ideas on safety program improvements is considered a best practice. The process emboldens the two-way communication addressed in question 7 and it leverages the responsibility of safety to each employee. This outcome enables greater buy in to an "all hands-on deck" safety program vice a reliance on a Safety Manager to accomplish it all. The latter creates complacency in risk management allowing latent threat to go unnoticed or unaddressed until it is too late.

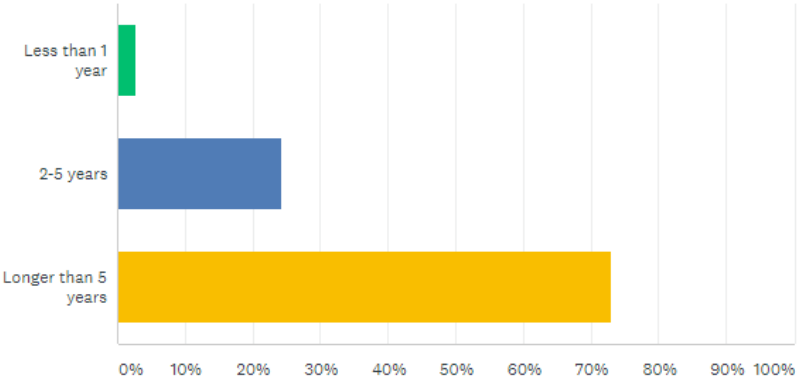
The General Manager and Safety Manager should analyze the comments made in response to this question and consider asking it on a routine (i.e., annually) basis.

Appendix 08 – Operator and Tenant Survey Data

Survey Group 3: Airport Operators and Tenants
Responses: 74
Completion Rate: 100%
Average time: 3 minutes
Most-skipped Question: #4

Question 1 - I have been an operator or tenant at TTAD for …

Summary Analysis – This question is designed to understand the demographic of those surveyed relative to time in years of experience and exposure to the airport. It is noted that almost ¾ of those who responded to the survey request have greater than five years. Basic analysis indicates there is either a large population of long-term operators and tenants (minimal statistical impact), or those with long-term experience are likely more engaging with surveys, feedback, open communication, etc.



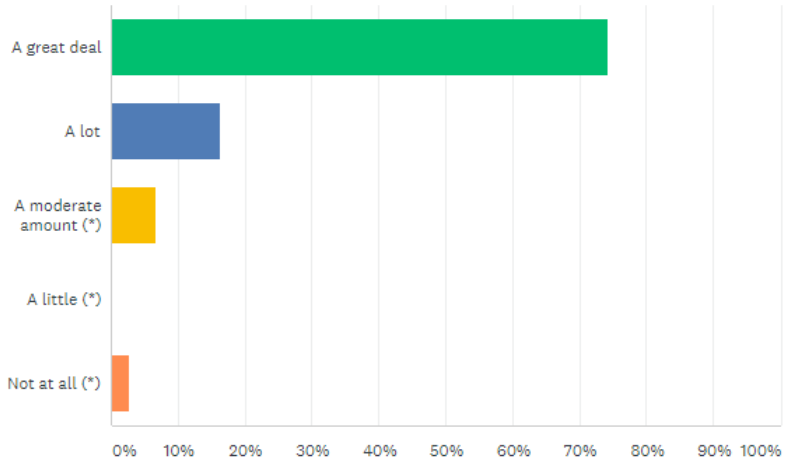
ANSWER CHOICES	RESPONSES	
Less than 1 year	2.70%	2
2-5 years	24.32%	18
Longer than 5 years	72.97%	54
TOTAL		74

Question 2 - I feel safe operating or working at the airport.

Summary Analysis – This question and subsequent results get right to the heart of Maslow's Hierarchy. Any answers at or above a "moderate amount" are a win for the culture of the airport and those responsible for cultivating it. However, since this group is essentially a "customer" of that culture these results are more about the processes, procedures, and business practices they are routinely exposed to. These results are to be celebrated as a win for the safety culture and engagement from the Safety Manager to the General Manager and every employee in between. It is also important to note these results are a measurable improvement since the 2015 Gap Analysis.

Recommend assessing the comments associated with this question to identify possible causes or contributing factors related to the two (2) respondents who chose "not at all".

This survey question should be used in future surveys to continuously assess the perception of feeling safe in the operating environment. These results should be considered as a baseline for periodic assessments in the same context relative to operators and tenants. A target of improvement is to gain a greater percentage in the "great deal" or "a lot" categories.



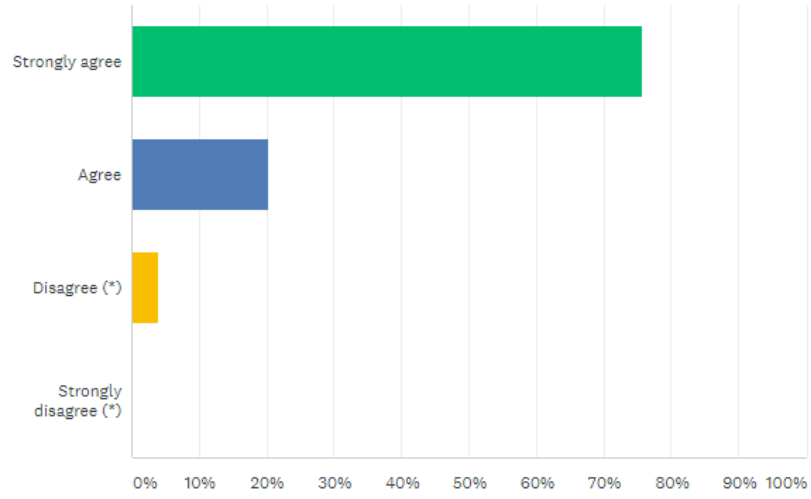
ANSWER CHOICES	RESPONSES	
A great deal	74.32%	55
A lot	16.22%	12
A moderate amount (*)	6.76%	5
A little (*)	0.00%	0
Not at all (*)	2.70%	2
TOTAL		74

Comments (6)

Question 3 - I believe safety is a priority of airport Management and Staff.

Summary Analysis – This question highlights subjective perspective of the actions of Management and Staff relative to implementing the priority put on safety. The "I believe" pretext places more emphasis on influence through multiple experiences or exposure to these actions vice a single or minimal of the same. A 96% positive response is testament to the intentional actions and communications by the General Manager and Staff to date.
It is important to note that three (3) respondents disagree with the statement above.

Recommend assessing the comments associated with this question to identify possible causes or contributing factors. It is logical to assume the two (2) negative respondents from question 2 may be a part of the negative replies. Without additional information, it is difficult to ascertain if these replies stem from a single incident perceived as unsafe and related to mis-prioritized safety or mismanaged risk.



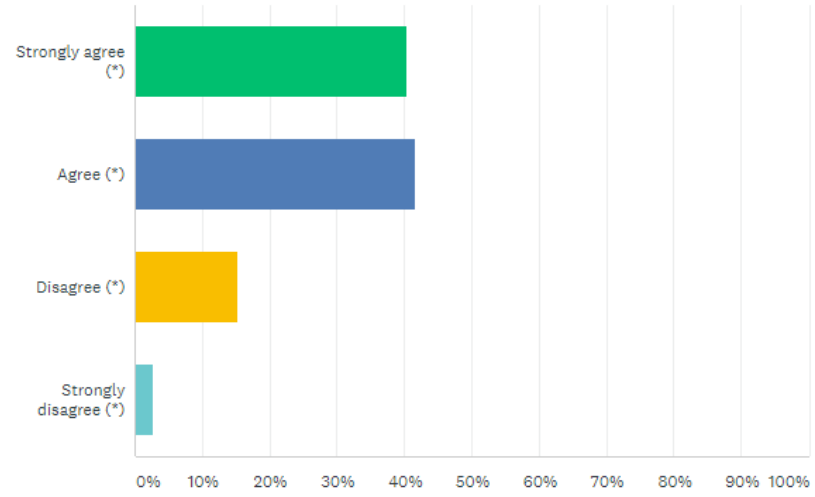
ANSWER CHOICES	RESPONSES	
Strongly agree	75.68%	56
Agree	20.27%	15
Disagree (*)	4.05%	3
Strongly disagree (*)	0.00%	0
TOTAL		74

Comments (5)

Question 4 - I am familiar with the airport Safety Staff and feel comfortable discussing safety concerns with them.

Summary Analysis – This is a two-part question with one response option, which must be considered while analyzing the results. Considering there are two official safety representatives on staff, it is not possible to decipher from the statistical answers however, this question generated 25 comments.

It is recommended for the General Manager and Safety Staff to review the comments. The common feedback is that the safety staff is generally not known by the operators or tenants. An industry best practice is to make the safety staff and representatives well known to operators and tenants utilizing various modes of communication. This normally involves a proactive PR-style campaign on a home web page, on communication boards, in correspondence, etc. The intent behind this is to improve even further upon the survey statistical data highlighted in questions 3, 5, and 6.



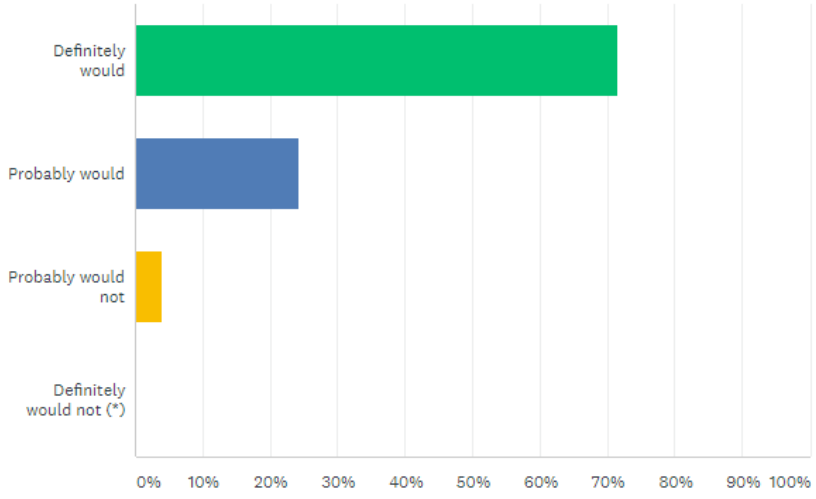
ANSWER CHOICES	RESPONSES	
Strongly agree (*)	40.28%	29
Agree (*)	41.67%	30
Disagree (*)	15.28%	11
Strongly disagree (*)	2.78%	2
TOTAL		72

Comments (25)

Question 5 - I feel comfortable reporting safety hazards to the airport Safety Staff or Management.

Summary Analysis – The reporting activity of an SMS is the most fundamental data source for hazard identification and true risk management (i.e., Step 1: Identify Hazards). The results of this question are incredibly positive with 96% of those surveyed having a sense of trust in the system and the protections of potentially sensitive information.

These results are to be celebrated as a win for the safety culture and engagement from the Safety Manager to the General Manager and every employee in between. It is also important to note these results are a measurable improvement since the 2015 Gap Analysis.



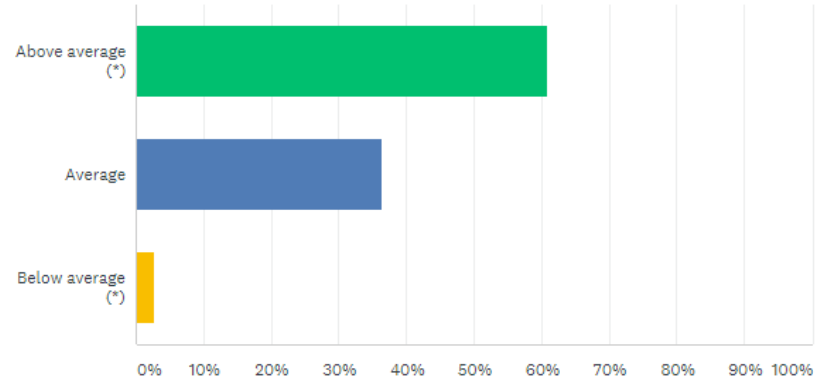
ANSWER CHOICES	RESPONSES	
Definitely would	71.62%	53
Probably would	24.32%	18
Probably would not	4.05%	3
Definitely would not (*)	0.00%	0
TOTAL		74

Comments (3)

Question 6 - Compared to other airports I operate(d) or work(ed) at, what level of a "safe airport" is Truckee Tahoe Airport in your opinion?

Summary Analysis – The results are incredibly positive with 97% qualifying the airport as average or above average (60.8%) in regard to safety. The operating environment and mindset of operators contribute to the overall safety culture. Where one feels safe in a working environment, there is likely a higher level of diligence, vigilance, and discipline. This level of performance then aligns with that of the employees supporting operators and tenants creating a well-synchronized effort to accomplish all tasks, roles, and responsibilities in a safe manner. This includes compliance with local procedures (i.e., quiet hours and noise abatement). It is logical to attribute this attractive feature of the airport environment to increased business by those who choose this airport over others.

Recommend assessing the comments associated with this question to identify possible causes or contributing factors related to the two (2) respondents who chose “below average”.



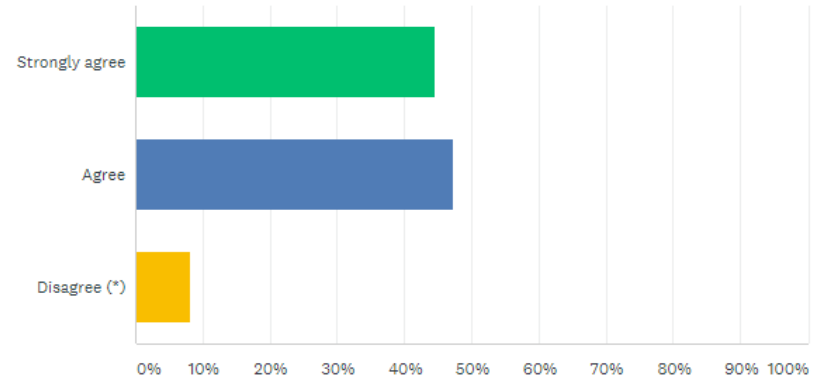
ANSWER CHOICES	RESPONSES	
Above average (*)	60.81%	45
Average	36.49%	27
Below average (*)	2.70%	2
TOTAL		74

Comments (12)

Question 7 - Safe operations and hazard reporting are emphasized enough at the Truckee Tahoe Airport.

Summary Analysis – This question was designed to quantify the emphasis of safe operations and hazard reporting. There is no bad result in the answers however, 92% of those surveyed qualify the amount of emphasis is impactful and influential. These results lead to further questions focused on what type of emphasis is working (i.e., passive/active communication, employee behavior, Safety Manger presence), and what frequency of emphasis is working. Realize, there is always room for improvement.

Recommend assessing the comments associated with this question to identify possible causes or contributing factors related to the six (6) respondents who chose “disagree”.



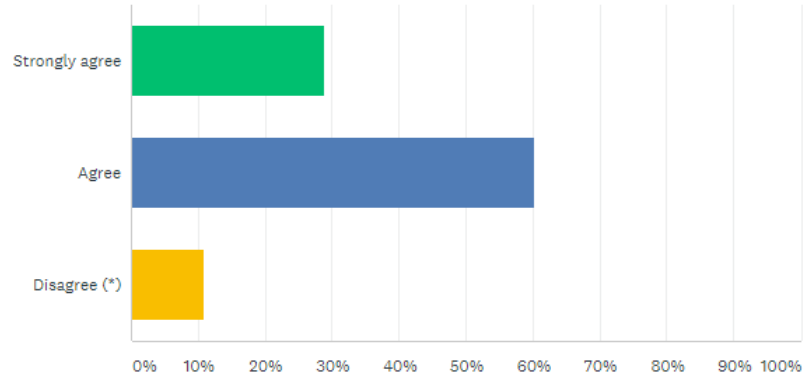
ANSWER CHOICES	RESPONSES	
Strongly agree	44.59%	33
Agree	47.30%	35
Disagree (*)	8.11%	6
TOTAL		74

Comments (5)

Question 8 - There is a regular exchange about safety related issues and risk management between airport employees and operators or tenants.

Summary Analysis – A key to successful hazard identification and risk management within an SMS is communication. The concept of two-way communication must be practiced and not just pronounced as an objective or even a value. Other than the executive responsibility of safety laid upon the General Manager, there really is no hierarchy of safety. The responsibility lays at everyone's feet creating a mindset that correlates to decisions and resulting behaviors. These results indicate an overt effort by management to address safety proactively and reactively with the employees and enable a culture of trust. A target of improvement should focus on a greater percentage of employees perceiving this rate of exchange as a "great deal" and "a lot" while eliminating the perceived minimal rates of exchange.

This survey question should be addressed by Directors to their specific functional areas of responsibility and the related employees. There are many techniques to ensure a systematic and regular exchange of safety related issues to include "safety talking points" for employees to share with others.



ANSWER CHOICES	RESPONSES	
Strongly agree	28.77%	21
Agree	60.27%	44
Disagree (*)	10.96%	8
TOTAL		73

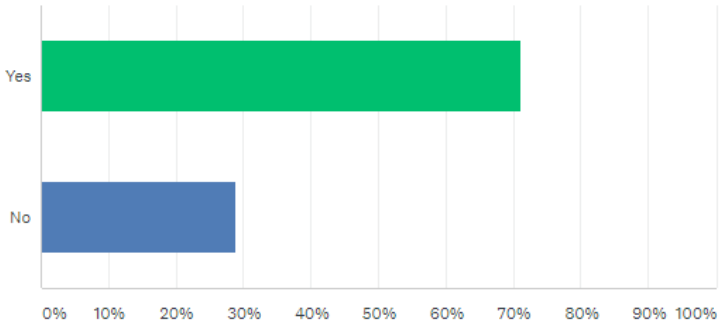
Comments (9)

Question 9 - Have you noticed an improved safety culture at the Truckee Tahoe Airport since you started operating or became a tenant?

Summary Analysis – A primary objective of the SMS implementation and supporting Gap Analysis in 2915 was to improve the airport safety culture. There are many ways to quantify the return on investment from that objective, while there are few to qualify it. The results of this survey question do qualify an improved safety culture relative to those surveyed with 71% affirming it.

This survey question should be used in future surveys to assess movement from this benchmark. A target of improvement is to gain a greater percentage of responses in the "yes" category while understanding the 'why' behind that perception. This will provide more qualifiers to strategies, plans, processing, and procedures in place.

It is recommended for the General Manager and Safety Staff to review the comments, which numbered the greatest amount compared to all other questions.



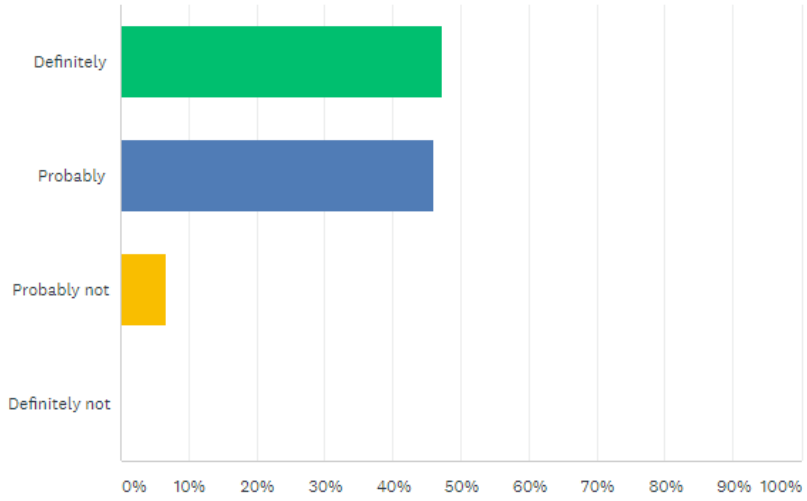
ANSWER CHOICES	RESPONSES	
Yes	71.23%	52
No	28.77%	21
TOTAL		73

Comments (28)

Question 10 - I believe I contribute to and have an influence on safe operations at the airport.

Summary Analysis – This question highlights subjective perspective of an individual's influence on safe operations. In order to leverage the actions and decisions of each individual into the overall cumulative safety value, they must first believe they contribute to it. Realize, this can be in either a positive or negative way. The 93% positive responses clearly indicate the Safety Manager and Safety Staff have done an exceptional job of developing a safety culture where there is not only passive buy in, but active contribution.

Each close call or mishap in aviation contains the pathology of sequential events acting autonomously or in concert with other variables to make up what is called the "safety chain". When mishaps are prevented it is normally because human interaction and intervention broke that chain and prevented the mishap. In a culture where a vast majority believe they have that ability and delegated responsibility, it is a logical conclusion that fewer mishaps will occur.



ANSWER CHOICES	RESPONSES	
Definitely	47.30%	35
Probably	45.95%	34
Probably not	6.76%	5
Definitely not	0.00%	0
TOTAL		74

Comments (12)

Appendix 09 – Safety Risk Assessment

This safety risk assessment is recommended as a technique to be considered as a standard tool to manage risk across all functional areas at the airport. Consultation and training will be provided if management decides to adopt this tool and associated risk management techniques. The training will be conducted in a train-the-trainer manner to establish common knowledge and enable continuity amongst Department Directors and airport personnel.

The adoption of this tool and associated strategy will provide for analysis of safety reports, risk identification, risk assessment based on likelihood and probability, and action items to mitigate or reduce the risk to a manageable level, if not eliminate it.

RISK ASSESSMENT MATRIX				SEVERITY					
				Negligible	Tolerable	Marginal	Moderate	Critical	Catastrophic
CATEGORY			People / Patients	Negligible/ Not Applicable	Minor injury or first aid treatment	Medical Evaluation/Diagnosis	Loss > 1 Day or Permanent Job Change/ Any patient Injury	Permanent Partial Disability or Inpatient Hospitalization/ Exacerbation of Patient Condition	Fatality or Permanent Total Disability
			Regulatory / Airworthiness / Compliance	Negligible/ Not Applicable	Violation of Internal Policy	Violation of Regulatory or Accrediation Standards	Potential Regulatory or Accredidation Action Sanctioned	License or Accredidation Suspension	License or Accredidation Revocation
				Negligible/ Not Applicable	Affecting aircraft or systems reliability	Affecting aircraft or systems reliability above established control limits but no effect on airworthiness or safety of operation of an aircraft	Returning an aircraft to service in an unairworthy condition, not operated	Operating an aircraft in an unairworthy but not unsafe condition	Operating an aircraft in an unairworthy and unsafe condition/ Unsafe operation of an aircraft
			Processes & Procedures	Negligible/ Not Applicable	No effect on processes or procedures, or for general informational purposes only	Little effect on processes or procedures	Process or procedural deficiencies leading to poor dependability	Partial breakdown of processes or procedures	Loss or breakdown of entire process
			Property	Negligible/ Not Applicable	Minor damage or vandalism to asset	Minor damage or loss of <5% of total assets	Damage or loss of <20$ of total assets	Extensive damage or loss <50% of total assets	Destruction or complete loss of >50% of assets
			Security/Threat Level (to teammate and/or assets)	Negligible/ Not Applicable	Uncooperative/ unauthorized access	Disruptive/verbally abusive behavior- suspicious or threatening	Physically abusive behavior/ malicious harm to asset	Life threatening behavior	Physical interference with the teammate or flight controls during flight
			Capability	Negligible/ Not Applicable	Minor skills impact. Minimal impact on non-core operations. The impact can be dealt with by routine operations	Some impact on organizational capability in terms of delays, systems quality but able to be dealt with at operational level	Impact on the organization resulting in reduced performance such that targets are not met. Organizations existence is not threatened, but could be subject to significant review	Breakdown of key activities leading to reduction in performance (e.g., service delays, revenue loss, client dissatisfaction, legislative breaches)	Protracted unavailability of critical skills/people. Critical failure(s) preventing core activities from being performed. Survival of the project/activity/ organization is threatened
			Economic/Cost of Mitigation	Negligible/ Not Applicable	<$5K	$5K - $15K	$15K - $25K	>$25K	
			Reputation	No Implication	Localized/Marginal	Statewide Attention	National Attention	Severe Financial Loss / Loss of Customer	
			Information	Negligible/ Not Applicable	Compromise of information otherwise available in the public domain	Minor compromise of information sensitive to internal or sub-unit interests	Compromise of information sensitive to the organizations operations	Compromise of information sensitive to organizational interests	Compromise of information with significant ongoing impact
Probability	>90%	**Almost Certain** Is expected to occur in most circumstances	AC	ACCEPTABLE	MEDIUM	MEDIUM	SERIOUS	HIGH	HIGH
	>65%	**Probable** Will probably occur in most circumstances	P	ACCEPTABLE	ACCEPTABLE	MEDIUM	MEDIUM	SERIOUS	HIGH
	>35%	**Occasional** Might occur at some time	O	LOW	ACCEPTABLE	ACCEPTABLE	MEDIUM	MEDIUM	SERIOUS
	<35%	**Unlikely** Could occur at some time	U	LOW	LOW	ACCEPTABLE	ACCEPTABLE	MEDIUM	MEDIUM
	<5%	**Remote** May occur only in exceptional circumstances	R	LOW	LOW	LOW	ACCEPTABLE	ACCEPTABLE	MEDIUM

Risk Classification Key			Risk Acceptor
Red	High	**Imminent danger, unacceptable. Highest priority for investigation, corrective action, and mitigation strategy.** Requires monitoring and recurrent review by appropriate authority. Acceptance of risk at this level is only authorized by CEO (or designee).	General Manager
Orange	Serious	**Unacceptable without full system analysis, investigation and mitigating action.** Requires action tracking and review by appropriate authority - EVP/SVP level.	Department Directors
Yellow	Medium	**May be acceptable with mitigation action, review and approval** by appropriate level Vice President or Regional Vice President or 119. Requires tracking and monitoring for trends.	Safety Manager
Blue	Acceptable	**May be approved without further action** by appropriate level Director or Regional Director (incl. Asst. Chief Pilots) if there are acceptable policies, processes and procedures in place. Monitor for trends. * See the most current Air Method Operations Specifications, Para A006, for current list of operational management.	Manager
Green	Low	**Little or no impact.** Approval by Manager or Regional Manager level without further action. May be acceptable without further action. * See the most current Air Method Operations Specifications, Para A006, for current list of operational management.	Airport Worker

Risk Assessment Matrix (example)

Appendix 10 – TTAD Reference Documents

This table lists the documents that were provided to Falcon16 Solutions for review by our SMEs.

Table 4 – List of TTAD Documents Reviewed by Falcon16 Solutions SMEs

DOCUMENT
2015 Gap Analysis and Safety Assessment Report
FAA Guide to Ground Vehicle Operations: A Comprehensive Guide to Safe Driving on the Airport Surface
Current Airport Layout Plan 2015
Airport Master Plan 2015
Facilities Maintenance Plan 2020
Pavement Evaluations Study/Pavement Maintenance & Management Plan
Environment & Land Use
Land Management Plan 2021
Waddle Ranch Forest Management Plan 2013
Truckee Tahoe Airport Land Use Compatibility Plan 2016
Community Outreach
Godbe Survey 2017
Governing Policy Instructions
TTAD Employee Culture and Core Values
Governing Policy Instructions
Vortex® SMS catalogued reports, documents, and communications