

May 27, 2016

Northern California TRACON  
11375 Douglas Road  
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Subject: **San Francisco Class B Ad Hoc Committee Recommendations**

To whom it may concern:

The San Francisco (SFO) Class B Ad Hoc Committee (Committee) has concluded our meetings and requests that the FAA consider the recommendations as outlined in the following report. These recommendations are the outcome of detailed examination of the existing airspace issues and what impacts may result from the proposed airspace designed to resolve them. Generally, the new airspace was viewed favorably by Committee members.

The Committee consisted of a diverse group of stakeholders including representatives from local airports, airlines, general aviation, and government agencies. The Committee met twice, once face-to-face at SFO over two days and an additional online meeting to resolve remaining questions, to discuss the *San Francisco Class B Airspace Modification Staff Study* dated October 19, 2015.

Following the review of the proposed Class B changes, a draft recommendation report was created, distributed, commented upon, and ultimately approved by the Committee. The Committee reached consensus on several recommendations, provided below in no order of prioritization. Additional comments were provided by individual Committee members that are included for the record, and to provide the FAA additional insight into user preferences and rationale.

### **Consensus Recommendations**

#### **Area A**

The Committee found the design of this area could be improved by the southern boundary, defined by points B016, B017, and B018 being relocated slightly north to follow Interstate 280. Additionally, the northern and eastern boundary, B001 through B007 should be defined by a DME arc off of the SFO VOR/DME. These modifications would benefit pilot identification of this surface area and would result in little change to the design.

#### **Area N**

This area should be further reviewed by the FAA for opportunities of greater stratification or subdivision with the following considerations:

- The underlying area includes high terrain so it would benefit general aviation to have higher altitudes to operate beneath the Class B airspace. A new fix on the SERFR Two STAR with an altitude crossing restriction of at or above 8,000 should be considered as a method to provide a higher floor altitude within this area. This fix should not adversely impact the optimized profile descent of the arrival.
- Containing airline arrival routes and preventing Class B excursions is important for well-recognized operational and safety reasons.

## Area Q

The FAA should evaluate this area for consolidation and to align the eastern boundary with a VOR/DME arc and/or prominent geographical landmarks (preferably both). The Committee discussed the benefits of the eastern boundary being relocated to the southern edge of Lake Del Valle and proceeding southbound to Mount Hamilton or the use of the SFO 33 DME arc.

## General Recommendations

- Due to the high number of operations at the Metropolitan Oakland International Airport (OAK), its close proximity to SFO, and the complexity of the airspace, the Committee recommends the Class C rulemaking process for OAK take place concurrently with the SFO Class B rulemaking process. The Committee believes operators and air traffic will benefit from such coordination so that underlying airspace issues in the metroplex can be fully addressed.
- The FAA should disclose in their staff study and in the upcoming notice of proposed rulemaking whether any airspace change is the result of a trend of Traffic Alert and Collision Avoidance System (TCAS) resolution advisories. The Committee recommends TCAS resolution advisory reports be considered as potential indicators for safety and traffic conflict probability.
- The enactment of the new SFO airspace should coincide with the VFR Class B Enhancement Graphic being updated to reflect the latitude/longitude, VOR/DME radial/distance, and prominent landmarks used for those waypoints defining the unique areas of the airspace. The VFR Terminal Area Chart should also be updated to reflect the prominent IFR arrival and departure routes to the primary (SFO) and significant satellite airports (OAK and SJC) within the Class B airspace.
- New Class B VFR transition routes should be defined by prominent geographical landmarks and VFR waypoints to improve aviator navigation and facilitate smoother communication with air traffic control and assist in the separation of aircraft.
- The Committee recommends the SFO Flyway Chart include an insert depicting the commonly utilized Oakland overflight route, as shown in 5.2.5, because of the situational-enhancing value it provides to operators. The Committee viewed this topic as another example of why the SFO airspace should be viewed holistically with the underlying Class C airspace, particularly if that underlying airspace is planned for a redesign or amendment that could impact other traffic flows and environmental impacts.
- The Committee recommends the FAA define the unique areas of the Class B airspace using VOR/DME radials and/or prominent geographical points, where beneficial. These two methods should not be utilized if an undue amount of airspace expansion would result as de facto Class B expansion would mismanage the national airspace system. The Committee recognizes the proliferation of GPS and moving-map displays but believes SFO airspace, in many cases, could accommodate airspace definition using non-exclusive alternate methods that are accessible to a greater number of pilots. Current guidance in FAA Order 7400.2 and Class B exhibits within the Staff Study (i.e., PHX, SAN, LAX) supports the position of the Committee.

- Class C and D airspace legal descriptions should be updated concurrently with the Class B airspace final rulemaking process.
- The Committee recommends the FAA contain Class B airspace within the Mode C veil where practicable to assure maximum operator situational awareness.
- The STAR/SID fix closest to the initial (i.e., outer) boundary of the Class B airspace should be shown on the VFR Flyway Planning Chart and IFR Area Chart for all frequently utilized IFR arrival and departure routes to SFO and major satellite airports. Showing these fixes will assist operators with situational awareness for Class B boundaries and help define the IFR arrival and departure routes relative to the primary airport.
- Informal meetings were viewed by the Committee as critical to the process of receiving local input including from aviators and non-aviators. The Committee recommends the FAA conduct extensive outreach in advance of these meetings and ensure comment periods are adequately advertised. Additional education and outreach to local pilot groups and aviation associations should be scheduled to follow publication of the final rule, but prior to the new airspace being charted and becoming operational, is also strongly recommended.

### **Individual Ad Hoc Member Recommendations**

#### **Southwest Airlines and National Business Aviation Association**

1. **Standard Instrument Arrivals (STARs) into the Oakland International Airport (KOAK)**  
 Currently as published, the EMZOH and OAKES Area Navigation (RNAV) Standard Instrument Arrivals (STARs) have vertical flight path segments that are located within the horizontal limits but below the vertical limits of both the current and proposed SFO Class B. SWA is strongly advocating that proposed modifications to the SFO Class B airspace be expanded so as to contain all published STARs into the Oakland International Airport (KOAK). This will further provide enhanced separation between air carrier jet traffic and VFR General Aviation traffic. KOAK STARs specifically affected include the “EMZOH” and “OAKES” RNAV STARs. The EMZOH and OAKES RNAV STARs are designed with energy efficient, optimized profile, idle thrust, vertical descent flight paths. CFR speed restrictions, specifically the 200 knots maximum speed while operating below a Class B, are not considered in their design per TERPS criteria. Consequently, given the flight characteristics of the Boeing 737, complying with the CFR speed restriction requires task intensive pilot intervention to include: reprogramming of Flight Management Computer (FMC) default parameters, early sustained use of drag devices, greater vulnerability to unintentional altitude constraint deviation and increased pilot monitoring tasks. Reprogramming the FMC calculated optimum speeds on the arrival corrupts the database derived vertical descent profile specific to these arrivals. As a result, it becomes difficult for the B-737 to achieve an appropriate vertical flight path. The resulting required interventions become unnecessary distractions where increased flight crew attention should be given to maintaining vigilance with respect to VFR traffic concurrently operating nearby and also outside the confines of the SFO Class B. Traffic Collision Avoidance System (TCAS) Resolution Advisory (RA) data indicate areas of significant air carrier and General Aviation (GA) conflicts along these arrivals specifically into KOAK.

In recognition of the stated scope of the SFO Class B redesign effort, maintaining the status quo with regard to STAR containment within the Class B will likely necessitate a complete redesign of the aforementioned STARs.

2. SFO Class B boundary definition

With regard to the proposed SFO Class B boundary definition, SWA objects on the grounds that such definition by oblique lines and polygons makes it exceedingly difficult for flight crews to recognize and identify aircraft position in relation to airspace boundaries. Neither current nor foreseen technologies provide the capability to accurately overlay and view airspace boundaries on approved cockpit navigation displays. Difficulty in identifying boundaries reliably by flight crews raises the likelihood of inadvertent non-compliance with Class B airspace restrictions along with the associated resulting risk.

## **Palo Alto Airport**

### 2.3 Updated Air Traffic Management Procedures

When an airport like SFO is located close to its Center's airspace boundary, controllers don't have as much time or airspace to meet the scheduled times of arrival. The adaptation of Traffic Management Advisor (TMA) to ZOA and NCT was purported to improve efficiency at SFO, an OEP airport. Adjacent Center Metering (ACM) was also identified as an enhancement that would enable ZOA sectors to adjust spacing between SFO arrivals using a combination of airborne holding, radar vectors, and speed control. TMA without ACM is not sufficient to effectively manage the SFO arrival volume, and ZOA must implement Miles-in-Trail (MIT) to adjacent facilities to accommodate flow control. MIT restrictions make it difficult for the ZOA Traffic Management Unit (TMU) to accurately meet the Airport Arrival Rate (AAR). TMA with ACM enables a more dynamic and accurate picture of Traffic Flow Management (TFM).

In 2010, the TMA Program Office purportedly prioritized the introduction of ACM to ZOA and surrounding centers. The OAPM Study Team (2012) also agreed that the introduction of ACM is necessary to increase the efficiency of SFO operations. However, the OAPM D & I Team did not address this issue of through - put efficiency and the Western Operations Support Group (FAA / WOSG) appears not to have had a previous interest.

### 2.7 Non-Rulemaking Alternatives

*There is no alternative to the rule-making process. Rule-making is required to adjust the Class B Airspace to accommodate the predictable, repeatable, and more efficient NextGen OPD's.*

This statement is very misleading. Continuous Descent Approaches (CDA) were the precursor to the now known OPD's. The philosophy of the profiles can be compatible with current regulatory airspace. The SERFR STAR was developed and implemented by the FAA irrespective of the Class B containment and excursion probability. Additionally, Traffic Management (TM) has failed to prevent the compaction probability of the design, by NOT providing proper in-trail "dynamic" spacing during heavy demand periods.

*The no-action alternative will require controllers to issue dynamic altitude restrictions to*

*all SFO arrivals so that they remain within the current Class B Airspace. This will increase both controller and flight crew workload. It will increase frequency congestion and chance for error for both controller and flight crew. It will negate the benefits of the NextGen OPD's.*

The lack of TM has produced an increased use of “delayed vectoring”, “linear holding.” To achieve spacing and sequencing of arrivals. The SERFR STAR is used by approximately 28% of the airports arrivals. On a daily basis over 50% of these arrivals are vectored off the STAR and S-turned for over thirty miles and re-sequenced. This action negates all efforts, and investments, of both the stakeholder user and the FAA (NextGen), to produce an efficient use of airspace. All of the aforementioned ramifications have been in place “historically” and are the product of the air traffic system and NOT the Class B configuration, even though the airport was identified by the *Operational Evolution Plan* (OEP).

### Area N

The FAA, through the aforementioned Representatives (2.3), must take a concerted effort to promote a pro-active game for the “ZOA Play Book” to minimize use of the delayed vectors by implementing additional internal controls to aircraft more distant to the Bay Area in order to minimize the volume of near simultaneous arrivals to Bay Area airports. Until ALL alternatives have been quantitatively and qualitatively analyzed, regulatory airspace should NOT be increased. The “Jurassic” way of doing business needs a new more futuristic view.

This issue is also subject to current FAA Initiatives / Solutions.

### 6.4 Air traffic Procedural Documentation

#### 6.4.4 NCT – San Francisco International ATCT Letter of Agreement, 2015-6-23 (LOA)

Current provisions of Attachment 3, state: “Tower must issue altitudes as specified below unless the correct Top of Climb (TOC) is published; RWY 28 IFR Departures issued straight out DP’s and headings including Landing Complex airport departures, J,T,P; 3,000’.” (Areas A, C, D)

This appears to be a “static” hold down which is devoid of operational, meteorological or hourly conditions and is NOT conducive of effective or efficient use of the current or proposed Class B airspace. It is recommended that Flight Standards (AFS-470) review this procedure for operational safety factors imposed on the operator / flight crews. Additionally it affects the primary airport’s noise foot print and countermands its noise abatement efforts for the surrounding noise sensitive communities. It also affects land use planning for the airport and aforementioned communities. This practice was not apparent in the current SFO PART 150 Study.

#### 6.4.5 NCT – SFO Standard Instrument Departures (SID’s)

The NIITE THREE (RNAV) has a speed of 220 knots or less and the WESLA THREE (RNAV) has a speed of 230 knots or less. The SNTNA TWO (RNAV) has no speed and a TOP of 3000’. FAA Order 7110.65, states 230 knots as a minimum speed that can be assigned for a departure aircraft. Each Standard Instrument Departure (SID) for Runways 28 appears to have different speeds and or “Top Altitudes” for the same initial leg segment, for no apparent reason. This affects the primary airport’s noise foot print and countermands its noise abatement efforts for the surrounding noise sensitive communities. (WOSG/FPT) (Areas A, C, D)

## **Aircraft Owners and Pilots Association**

AOPA is supportive of many aspects of the proposal but feels the airspace design and the process could be improved. We provide the following recommendations and observations on behalf of general aviation pilots:

- The Staff Study determined there was no alternative to rulemaking in order to accommodate the optimized profile descent procedures implemented as part of the Metroplex process. AOPA believes the procedures were required, per the Metroplex Record of Decision, to comply with existing FAA guidelines; however, failed to do so. AOPA therefore does not concur with section 2.7 as we believe the flight procedures which raised safety concerns should have been required to meet FAA airspace requirements. The FAA should ensure policy is updated or complied with to ensure future Metroplex processes do not result in Class B excursions as they do present an operational issue and safety hazard.
- The Class B general design guidance, as provided in 15-2-3 of FAA Order 7400.2, is largely not followed by this redesign with positive and negative implications. AOPA believes this area of FAA policy should be updated in a collaborative manner with industry to ensure future redesigns are provided guidance that is in line with modern day operator and air traffic expectations.
- As was previously stated in the consensus section, AOPA believes there are many pilots flying without moving maps and airspace should be designed to the maximum extent in a simple and easy to identify manner, i.e., geographical landmarks and/or VOR DME/radial; however, this should be done with the consideration of not unnecessarily expanding surface areas. Dead reckoning and visual cues are vital for airspace avoidance and identification for many pilots.
- The FAA should reexamine those areas where the Class B is being expanded, lowered, or maintained at an artificially lower floor altitude to provide a buffer between the bottom of the Class B and the actual altitude traffic inbound or outbound to the primary airport (SFO) is predicted or verified to be operating. Varying volumes of buffer altitude are acknowledged to be utilized which consequently increases the vertical dimensions of the Class B airspace. The FAA should provide data to justify why these buffers are utilized and how the amount of buffer altitude was calculated as there is no guidance on the subject.

## **Conclusion**

On behalf of the Committee, I want to thank the FAA for the work they have put into this process and for the opportunity to provide these recommendations. With the submission of these recommendations, the SFO Class B Ad Hoc Committee is dissolved. If you have any questions regarding the information provided in this report, please feel free to contact me at 650 591 8308.

Sincerely,



Carol Ford  
Ad Hoc Committee Chairperson  
Vice President, California Pilots Association

**SFO Class B Ad Hoc Committee Membership**

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Glenn Morse, United Airlines  
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Dennis Hughes, City of Palo Alto Consultant  
Marlon Varin, California Highway Patrol  
John Swaney, Hewlett Packard Enterprise  
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