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Class B Airspace: Designation, Design and Evaluation

A Report of the Tactical Operations Committee in Response to Tasking from the Federal Aviation Administration

September 2015

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Contents

Background

To address the risk of midair collisions between IFR (Instrument Flight Rules) and VFR (Visual Flight Rules) aircraft, the FAA established protected airspace in which air traffic controllers manage air traffic operations to, from and through the airspace. Formerly known as Terminal Control Areas (TCAs), by the 1990s, TCAs became Class B airspace and were centered around airports with high density air traffic operations. In addition to establishing airspace classification, a set of mandates was established as part of a comprehensive plan to avert midair collisions. This included airspace designation criteria and design parameters, found in FAA JO 7400.2. Controller separation, pilot qualification, and aircraft equipage requirements were also established in this effort. This approach was applied to all classes of airspace – ICAO classes A through G. The mandates and requirements are the most restrictive for Class A and become less restrictive through G (currently, Class F is not used in the National Airspace System [NAS]).

Since the original criteria for Class B designation and design were established, a variety of structural changes have occurred within aviation that warrant a re-evaluation of these criteria. One key change has been the rise and fall of major airlines hub status for certain airports. Over the past decade, some airports with Class B airspace, such as Lambert–St. Louis International Airport (STL), Cincinnati/Northern Kentucky International Airport (CVG), and Pittsburgh International Airport (PIT) have seen their status as a primary hub removed and scheduled traffic drop precipitously. Today, 15 out of 37 primary airports with Class B airspace do not meet criteria for designation of Class B and some Class C airports have more operations than those with Class B airspace.

At the same time, there has been a growth of business aviation, cargo operations and low cost operators which have increased the use of secondary and satellite airports by high performance aircraft. Consequently, the mix of high performance IFR and lower performance VFR aircraft have evolved such that higher performance aircraft are operating to and from secondary or satellite airports in greater volumes, thus increasing the risk associated with the mix of IFR and VFR operations.

Finally, new technologies allow us to rethink Class B design. Recent advances such as the increased utilization of the Global Positioning System (GPS) for navigation provide an opportunity to evolve the design of Class B airspace. In a few cases, such as Seattle-Tacoma International Airport (SEA) as well as Los Angeles International Airport (LAX), the potential for replacing the traditional cylindrical “upside down wedding cake” with more linear designs, resulting in a smaller volume of protected airspace, has been demonstrated.

Given these developments over the last two decades, the FAA recognized a need a take a fresh look at the minimum criteria for designation of Class B airspace and asked the Tactical Operations Committee (TOC) to address the following:

- Class B designation requirements
- Appropriate considerations for Class B airspace design criteria
- The evaluation process for airspace biennial reviews including criteria to expeditiously reduce or eliminate Class B airspace that no longer meets designation requirements
- Guidance on how to gather local user input to any changes to Class B designation, design and evaluation as well as mechanisms to communicate a final updated process to key stakeholders.

Executive Summary

Background

In the decades since Class B designation criteria and design guidance were established, a variety of structural changes have occurred within the NAS that warrant a re-evaluation to determine if they are still applicable and whether they continue to serve the original purpose of protected airspace. The FAA requested the RTCA Tactical Operations Committee (TOC) to address the following issues related to designation, design and evaluation of Class B airspace:

- Designation of Class B Airspace
- Modification of Class B Airspace
- Evaluation of Class B Airspace
- Recommendations on the Process for External Engagement on Changes to the Class B Guidance.

Class C airports are typically the candidates for Class B designation and Class C airspace would likely replace Class B if it was revoked. Therefore, the Class B Task Group examined Class C designation criteria and design guidance in parallel to the group's efforts on Class B. Both classifications were developed to reduce the risk of midair collisions in congested airspace surrounding airports. With the aid of safety data and subject matter experts, the committee found that volumes of airspace designated as Class B, as well as Class C, have been effective in meeting their purpose.

Class C airspace protects less airspace for IFR operators than Class B. In determining whether Class B designation is warranted, a facility is required to demonstrate that Class B airspace is necessary to correct a current airspace problem that cannot be solved without Class B designation. One potential way to correct an airspace problem could be to expand an existing Class C design. Conversely, if Class B revocation is being considered, the result is likely to be less protected airspace. Using current design guidance, going from Class B to Class C airspace would reduce the lateral boundary from 30 to 10 nautical miles and reduce the ceiling from 10,000 to 4,000 feet eliminating the requirement that VFR aircraft communicate with ATC in this vacated volume of airspace. The Task Group concluded that the salient issue is not whether an airport meets Class B criteria, but rather whether the airspace solutions developed to address operational issues are appropriate and effective (e.g., expansion of Class C or modification of Class B airspace).

There are operational and safety implications associated with expanding and reducing protected airspace. Expansion can improve safety in areas of high concentrations of IFR and VFR traffic. However, the expansion can result in VFR aircraft having to fly additional miles and in the compression of airspace available to VFR traffic, which can lead to an unsafe flying environment. Reduction of protected airspace will make more airspace available to VFR aircraft in which they can operate without talking to ATC. However, reduction of protected airspace will, by definition, result in less protected airspace for IFR traffic. These types of considerations and tradeoffs highlight why it is important to consider each site's unique operational issues when determining the appropriate airspace solution.

Summary of Recommendations

Table 1 is a summary of the committee's recommendations organized by the Class B issues identified by the TOC. The remainder of this section provides a high level overview of the rationale behind the recommendations. More detail on the rationale for each recommendation is provided in the following sections.

Designation of Class B Airspace

Safety data and discussions with subject matter experts indicate that the majority of safety related issues occur outside of the protected volumes of airspace and that both Class B and C airspace are achieving their objective. From the same sources, the committee learned that the ratio of IFR to VFR traffic is not a reliable way of assessing collision risk. Additionally, the committee noted that there is no discernible relationship between the enplanement criterion and the risk of midair collision and that the primary airport traffic count criterion does not reflect other factors that contribute to airspace complexity in busy terminal areas. Safety metrics that are more directly related to IFR/VFR collision risk than the original criteria are now available. The feasibility of using them to generate risk-based metrics for designation criteria should be examined.

Modification of Class B Airspace

Class B and C airspace design guidance was based on legacy TCA cylindrical criteria centered on ground based NAVAIDS. The purpose of the designs was to facilitate containment within the protected airspace with simplified designs based on the technology available at the time. Today's navigational technology allows for better navigation and containment. Class B and C design guidance should not be rigidly applied. Designs should be site specific and take into account any unique operational and safety needs along with consideration of all of the airspace users.

Evaluation of Class B Airspace

The current evaluation process considers candidates for Class B designation and possible modifications to existing Class B airspace. However, no criteria or process currently exists for the revocation of Class B airspace. For determining whether Class B is needed, safety related data now exist and should be used to help determine airspace needs. Class B revocation will require estimating how safety will be impacted by potentially reducing the size of the protected airspace which could affect the behavior of VFR traffic in particular.

Public Engagement Recommendations

Consistent with other significant airspace changes, effective public engagement is recommended before the implementation of any changes to Class B designation criteria, design guidance, or evaluation process. Whether communicating draft language or a Final Rule of changes to the Class B guidance, the group recommends the FAA utilize one centralized and consistent package of information across all public engagements to mitigate the potential of mischaracterization and message confusion.

Table 1 Summary of the Committee's Recommendations

Class B Issue	Recommendations
Designation of Class B Airspace	The FAA should remove the enplanement and air carrier/air taxi quantitative criteria
	Total Airport Operations Counts should also include traffic from secondary airports and overflights
	An airspace complexity index should be developed to address airspace considerations beyond that of Total Airport Operations
	Criteria should be developed for airports with strong seasonal or time of day demand surges
	Use available safety data to more directly assess airspace complexity issues and mitigations
	Provide more guidance on how operational issues can be addressed without the Class B designation
	The FAA should periodically review Class B designation criteria to determine whether they should be adjusted
Modification of Class B Airspace	Remove existing guidance indicating design should be centered on a NAVAID and amend guidance to ensure designers leverage the flexibility to configure airspace that maintains Class B safety standards
	Require a review of Class B airspace and instrument procedures whenever new runways are built, existing runway changes occur (e.g. decommissioned, lengthened, or shortened) or when procedures are developed or old ones canceled
	Encourage designers to make maximum use of existing tools to accommodate VFR flights through or around Class B airspace
	Evaluate lateral and vertical gaps between adjacent airspace where VFR flight has the potential to increase hazards for Class B or Class C operations
	Recommend introduction of an altitude buffer between protected IFR airplanes and VFR aircraft
	Ensure all Class B Terminal Area Charts include information on IFR arrival/departure routes to/from the primary airport and explore possibility of extending to include secondary airports
Evaluation of Class B Airspace	Update FAA Order 7400.2 with additional guidance on data sources relevant for the biennial review
	Develop criteria for identifying when Class B airspace should be revoked
	Outline a process for revoking Class B airspace
Recommendations on the Process for External Engagement on Changes to Class B Guidance	Conduct further public engagement before implementation of any design, designation and evaluation changes to Class B guidance
	Whether communicating draft language or a Final Rule of changes to the Class B guidance, the group recommends the FAA utilize one centralized and consistent package of information across all public engagements

Methodology

The Tactical Operations Committee established an Ad Hoc Task Group, known as the Class B Task Group to draft a response to the task request. The task group was composed of airspace experts from a variety of perspectives including MITRE, FAA Airspace Policy, FAA Safety, FAA Service Center, Commercial flight operators, Business Aviation, Department of Defense (DoD), General Aviation, and Labor. (Please see Appendix A for a full list of Task Group membership.) The group held a series of meetings from January through June 2015 in which it examined the history of protected airspace, data analysis on a wide variety of issues relating to Class B and C airspace as well as Case Studies around the NAS. During April through July 2015, the Task Group deliberated the task questions and documented its conclusions in this consensus report.

Based on the questions posed by the FAA, the Task Group elected to organize its response along four major categories:

1) Designation of Class B Airspace
2) Modification of Class B Airspace
3) Evaluation of Class B Airspace
4) Recommendations on the Process for External Engagement on Changes to the Class B Guidance.

Designation of Class B Airspace

Introduction and Observations

For an airport to be considered as a candidate for new Class B airspace designation, the criteria shown in Table 2 must be met (adapted from 7400.2, Chapter 15-2-1). The first two rows contain quantitative criteria and are necessary but not sufficient for the establishment of Class B airspace. The last row is qualitative and must be met in addition to the quantitative criteria to establish Class B.

Table 2 Criteria to be Considered for Designation of Class B Airspace

Criterion from 7400.2 15-2-1	Text of Criterion
Enplanement	The primary airport serves at least 5 million passengers enplaned annually
Total Airport Operations	The primary airport has a total airport operations count of 300,000 (of which at least 240,000 are air carriers and air taxi)
Necessity of Class B Designation	The Class B designation will contribute to the efficiency and safety of operations, and is necessary to correct a current situation or problem that cannot be solved without a Class B designation.

Class C airspace will typically be the candidates for Class B designation. Therefore, the Class B Task Group recognized the need to examine Class C designation criteria and design guidance in parallel to the group's efforts on Class B. Class C designation criteria are shown in Table 3.

Table 3 Criteria to be Considered for Designation of Class C Airspace

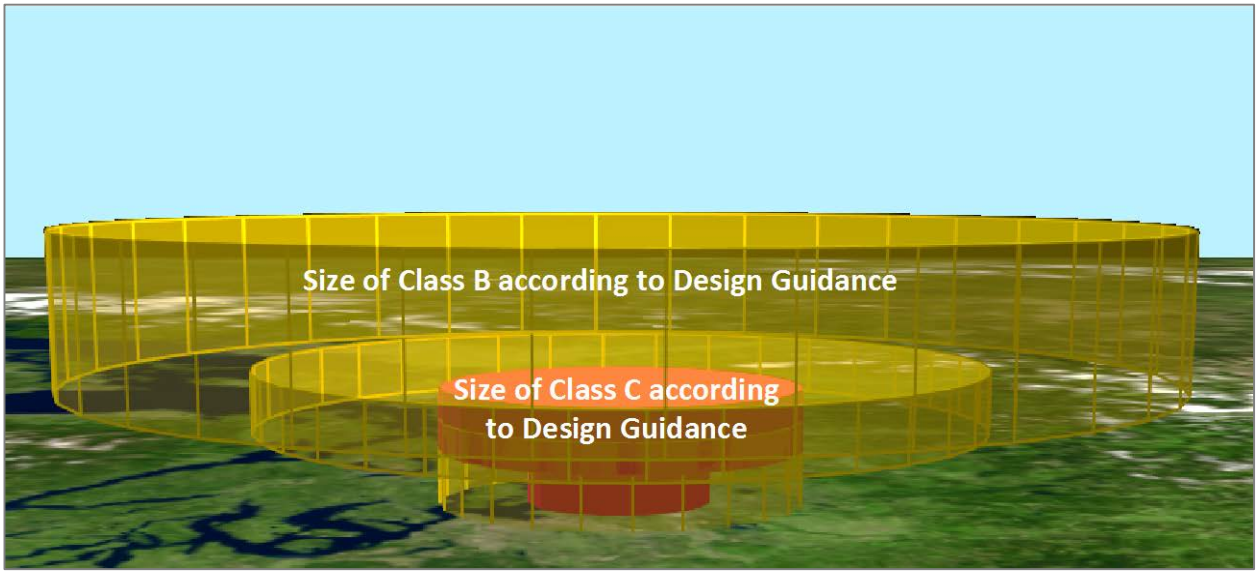
Criterion from 7400.2 16	Text of Criterion
Primary Airport Operations	An annual instrument operations count of 75,000 at the primary airport
Primary and Secondary Airport Operations	An annual instrument operations count of 100,000 at the primary and secondary airports in the terminal area hub
Enplanement	An annual count of 250,000 enplaned passengers at the primary airport

There are large differences between the quantitative designation criteria and the design guidance for Class B and C airspace. As can be seen in Table 4 and Figure 1, if strictly followed, Class C design guidance results in a much smaller volume of protected airspace than Class B airspace.

Table 4 Design Guidance for Class B and C Airspace

Airspace Class	Design Guidance in 7400.2
Class B	Generally from the surface to 10,000 feet mean sea level (MSL). The outer limits of the airspace must not exceed a 30 NM radius from the primary airport. This 30 NM radius will generally be divided into three concentric circles: an inner 10 NM radius, a middle 20 NM radius, and an outer 30 NM radius.
Class C	Generally from the surface to 4,000 feet above the airport elevation (charted in MSL); usually consists of a surface area with a 5 NM radius, an outer circle with a 10 NM radius that extends from no lower than 1,200 feet up to 4,000 feet above the airport elevation

Figure 1 Size of Class B and Class C According to Design Guidance



Purpose of Class B and C airspace

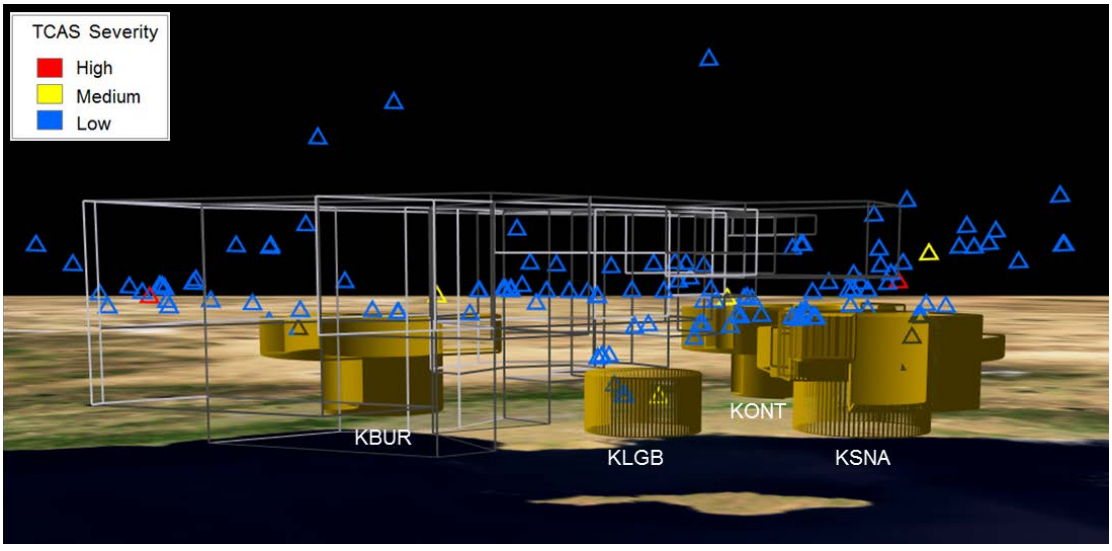
According to Chapter 15 of the 7400.2 guidance, the primary purpose of Class B airspace "is to reduce the potential for midair collisions in the airspace surrounding airports with high density air traffic operations". A secondary purpose of Class B is to "enhance the management of air traffic operations to

and from the airports therein, and through the airspace area". Class C airspace areas are designed to improve aviation safety by reducing the risk of midair collisions in the terminal area and enhance the management of air traffic operations therein." Although the purpose of both Class B and Class C is to reduce the potential for midair collisions, the target aircraft, as well as the geographical areas, differ. Class B is intended to enhance the management of aircraft in and out of the airport(s) contained in the surface portion of the Class B while Class C is for aircraft traversing the terminal area regardless of intended airport of operation. The difference between the two is that Class B criteria do not consider the traffic in the surrounding terminal area in its calculation while Class C criteria do.

Effectiveness of Class B and C Airspace

Given that the purpose of both Class B and C designations is to reduce the risk of midair collisions, the Task Group sought to determine whether the two designations have achieved their objective. Both Class B and Class C have been effective at avoiding midair collisions. Additionally, discussions with FAA Air Traffic Organization (ATO)'s Safety and Technical Training (AJI) and operational facilities (Daytona Beach International Airport, Southern California TRACON) indicated that the overwhelming majority of Traffic Collision Avoidance System (TCAS) Resolution Advisories (RAs) or other reported safety incidences between IFR and VFR flights associated with Class B and C airports occur outside (but near the boundaries) of Class B and C airspace volumes. Calculated TCAS RAs between IFR and VFR traffic at Class C airports near Los Angeles International Airport (LAX) (Figure 2) support the findings from the discussions. The TCAS RAs were calculated using actual flight tracks and TCAS Exploration Display (TED), a tool developed for AJI by MITRE. (For a high level description of the TED tool, see Appendix C.)

Figure 2 TED Tool Location of Calculated TCAS RA's in the Los Angeles Basin



Recommendations

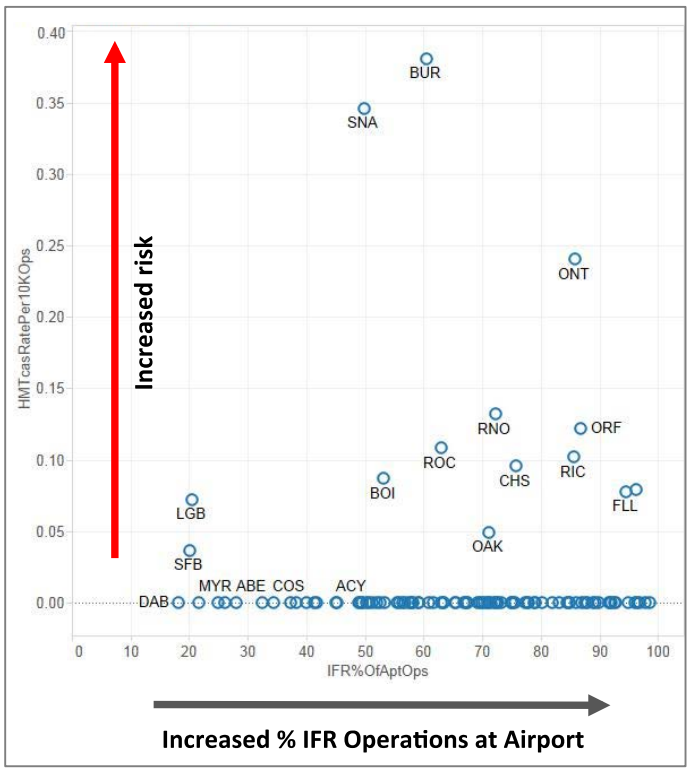
Enplanement and Air Carrier/Taxi

Recommendation 1.	**The FAA should remove the enplanement and air carrier/air taxi quantitative criteria.**

Both the Enplanement and 240,000 operations Air Carrier and Air Taxi criteria give more weight for providing Class B airspace protection to aircraft carrying large numbers of passengers. However, reducing mid-air collisions between large passenger aircraft and VFR is not explicitly referred to in the purpose statement for Class B airspace, which focuses more generally on the avoidance of midair collisions between IFR and VFR aircraft.

The air carrier and air taxi operations requirement of at least 240,000 suggests that airspace with higher percentages of IFR traffic are more in need of Class B designation. Analysis presented to the Task Group (Figure 3) and discussions with subject matter experts indicated that different levels of IFR percentages (from low to high) can contribute to airspace complexity and the potential need for Class B. Figure 3 shows calculated TCAS RA rates between IFR and VFR traffic using TED. High and medium severity level TCAS RAs are displayed versus the percentage of IFR traffic. All of the airports on the chart are Class C with the exception of Long Beach Airport (LGB) which is a Class D with known airspace complexity issues. The TCAS RA rates for each airport are calculated beyond the boundaries of the Class C airspace, laterally from 10 to 30 nm and vertically from 4,000 to 10,000 feet, to represent the additional airspace that would be protected by Class B. The airports with the highest TCAS RA rates (Bob Hope Airport [BUR] and John Wayne Airport [SNA]) have IFR traffic percentages in the 50 to 60% range.

Figure 3 TED Tool Calculated TCAS RAs vs Percent of IFR Operations



Total Airport Operations

Recommendation 2.	**Total Airport Operations counts should also include traffic from secondary airport and overflights.**

Currently, the Total Airport Operations criterion (300,000 operations required) includes only the primary airport. The Task Group did not have the time or the resources to thoroughly assess whether 300,000 operations is the appropriate threshold. Therefore, the Task Group is not recommending that the 300,000 operations requirement be changed. However, traffic from nearby airports and overflights can affect traffic behavior and increase ATC workload and potential traffic hazards and therefore should be included in the Total Airport Operations count criterion.

Recommendation 3.	**An airspace complexity index should be developed to address airspace considerations beyond that of Total Airport Operations.**

There are considerations beyond Total Airport Operations that can provide insight into airspace needs. Special Activity Airspace (SAA) and terrain that are in close proximity to a primary airport can affect traffic behavior and increase ATC workload and potential traffic hazards. An airspace complexity index would be analogous to what is used to adjust traffic counts when determining air traffic facility levels. For airports that have challenging airspace features but do not meet the Total Airport Operations criterion, the development of an airspace complexity factor that can be applied to modify (increase) the

number of operations could help to elevate their operational issues. However, as with all other candidates, the airport would still have to demonstrate that the Class B designation is the only remedy for their operational issues.

Recommendation 4.	**Criteria should be developed for airports with strong seasonal or time of day demand surges.**

The impact of demand surges can be diluted by the Total Airport Operations criterion. The current criterion does not address airports where, if annualized, peak seasonal traffic counts or peak hourly blocks would meet the current Class B quantitative designation requirements. Demand surges during these time periods increase both air traffic controller workload and the level of safety hazards. For example, the winter months at Fort Lauderdale–Hollywood International Airport (FLL) have significant increases in demand. The 300,000 Total Airport Operations criterion averages to 25,000 operations a month. Figure 4 shows monthly airport operations at FLL where monthly counts have exceeded 25,000 operations in the past and are currently coming close to that threshold again[1]. An annualized monthly operations criterion could be considered to address seasonal surges.

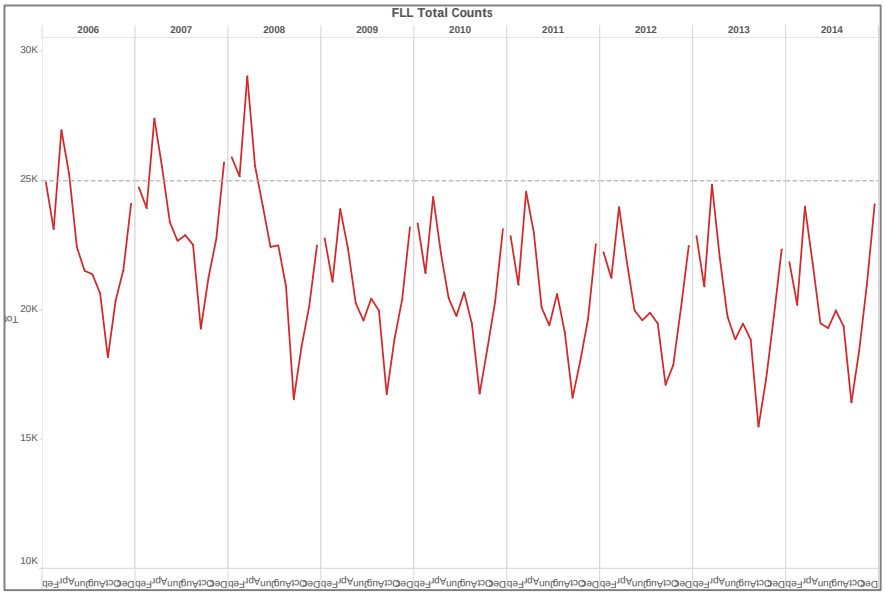
Additionally, Class C airspace currently has an option for full-time or part-time designation. A similar approach could be considered for Class B airspace with time of day demand surges. There may be some locations, now or in the future, where multiple consecutive peak hours of traffic demand meets Class B quantitative thresholds when annualized. In such cases, consideration may be given to identifying criteria for a part-time Class B designation that has published times and is well understood by all operators. Note, part time Class B designation would only be feasible if the peak hours were consecutive and the activation and deactivation of Class B airspace were clearly defined. This may be the case for some airports, particularly those with overnight cargo operations.

As with all other candidates, meeting the quantitative criteria would not be sufficient to receive Class B designation – they would still be subject to the requirement of proving that the Class B designation is necessary to address their operational issues.[2]

[1] Runway construction in FLL reduced operations from 2011 to 2014. A second parallel runway was completed in September 2014 and flight operations are no longer constrained in FLL by construction.

[2] The Task Group considered dynamic (i.e., "on/off") Class B sectors. After further deliberation, the Task Group identified key challenges in the current operational environment with implementation of dynamic Class B sectors. The core question is what mechanism would be utilized to notify pilots when a Class B sector is active or inactive. Additional questions include how VFR aircraft utilizing an inactive Class B sector would be notified to vacate, how long the aircraft would have to vacate, what equipment would be required for VFR aircraft to utilize inactive Class B sectors, etc. Existing technology such as ADS-B In and Moving Map displays with color-coding and voice alerting could be utilized to operationalize this concept. Ultimately, there is significant effort required in operational concept development, aviation rule making and regulations before such a concept could be implemented. The Task Group believed the concept of dynamic Class B sector was interesting and worth future consideration. However, it was also deemed to be beyond the scope of this report and no formal recommendation on the topic is included in this document.

Figure 4 Monthly Traffic Counts in FLL: Feb 2006 to Dec 2014



Recommendation 5. Use available safety data to more directly assess airspace complexity issues and mitigations.

Although the Total Airport Operations criterion serves as a good starting point in identifying potential Class B locations, it does not directly address safety issues between IFR and VFR traffic. Ideally, safety metrics (actual or calculated metrics based on surveillance data) should be used to assess the risk of midair collision between IFR and VFR aircraft. Currently, the FAA's Operations Support Group (OSG) does not have access to safety metrics beyond excursions in PDARs and the ability to do keyword searches on items like TCAS in Mandatory Occurrence Reports (MORS), NASA Aviation Safety Reporting System (ASRS), and Air Traffic Safety Action Program (ATSAP) databases. Access to tools (e.g., AJI's TED) that generate safety metrics that directly measure risk of IFR/VFR interaction would enhance the candidate assessment process. Safety metrics should be examined to determine how risk-based safety metrics can be used to assess the need for Class B airspace. In the near term, airports with above average TCAS RA rates for their airspace class can be identified and considered as candidates. They would still be subject to the requirement of proving that the Class B designation is necessary to address their operational issues.

Necessity of Class B Designation

Recommendation 6. Provide more guidance on how operational issues can be addressed without the Class B designation.

Class B airspace protects a larger volume of airspace than Class C and requires additional levels of compliance from controllers, pilots, and aircraft. Therefore, before Class B airspace should be established, evidence of the need for Class B designation must be provided. If other mitigation strategies besides Class B designation can address the operational issues presented, they must be applied instead.

Some mitigation strategies that have proven effective at Class C airports are pilot education, procedural changes, and expansion of Class C lateral limits. Although language describing configuration variations for Class C airspace (7400.2 Chapter 16) allows flexibility to expand beyond the standard design parameters, lateral boundaries have only been extended on the final approach segments of the airspace as in the case of Mineta San José International Airport (SJC). The FAA should make it clear that current design language provides the flexibility to expand Class C as needed both laterally and vertically. Further expansion of Class C may be warranted for some operational issues and should be considered before the designation of Class B airspace.[3]

Future Considerations

Recommendation 7.	**The FAA should periodically review Class B designation criteria to determine whether they should be adjusted.**

The NAS has changed significantly over the last 20 years – e.g., changes in passenger and cargo aircraft hubs, business aviation, and GPS navigation. Given that the rate of change in the NAS is actually increasing (particularly regarding new entrants), it is recommended that designation criteria be reviewed as technology, demand or other structural factors evolve in the NAS.

Design of Class B Airspace

Introduction and Observations

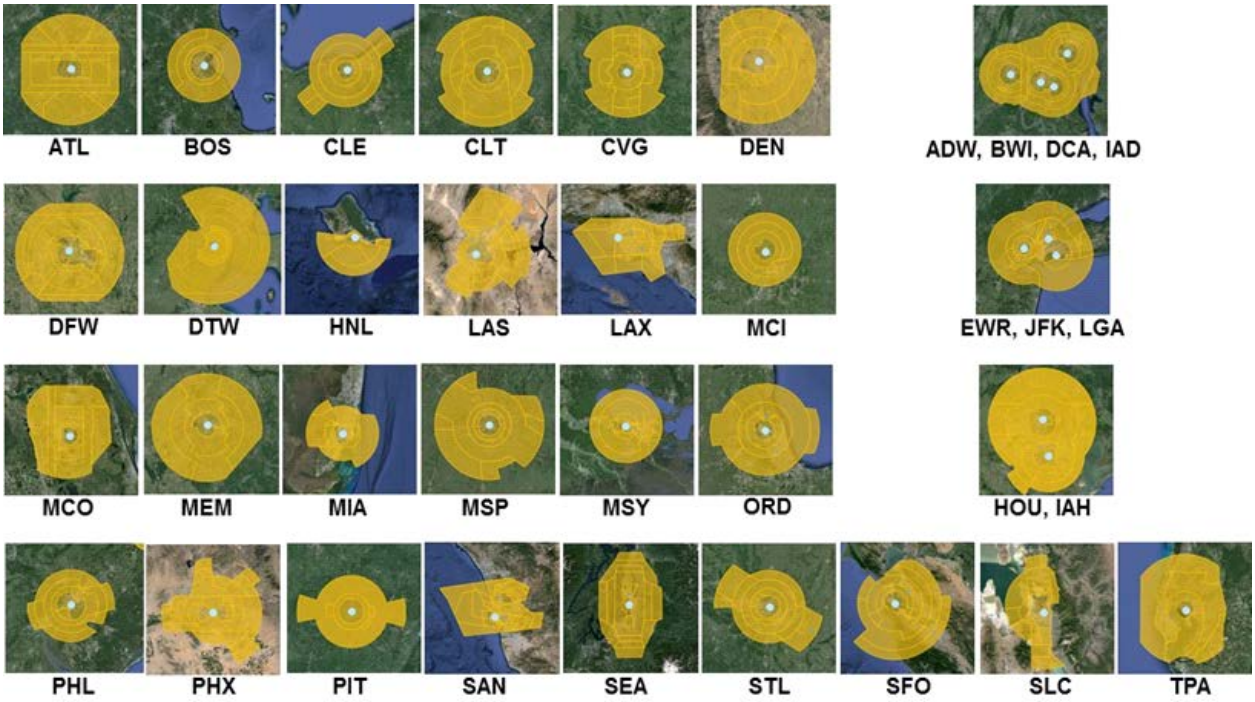
Existing Class B Designs

The majority of existing Class-B airspace designs are generally cylindrical, centered on a high density airport, and based on Navigational Aids (NAVAIDS) such as a VORTAC, VOR/DME or lat/long coordinates. The lateral limit extends outward up to 30NM from the primary airport and divided into three concentric circles. The vertical limit of Class-B airspace normally extends from the surface at the primary airport up to 10,000 feet MSL. Moving outward from the primary airport the floor of the airspace steps up to varying altitudes.

The following diagram shows current Class B airspace designs within the NAS. Note that the majority of these are cylindrical in shape.

[3] Careful consideration should be given in order to avoid creating unintended flying hazards. Expansion of Class C or designation of Class B airspace may result in the reduction of airspace in which VFR aircraft operate by compressing the traffic in these areas which is also utilized by high performance IFR operators to and from secondary airports.

Figure 5 Bird's Eye View of Class B Airspaces in the NAS



14 CFR section 91.131 sets aircraft equipment requirements in order to operate within Class B. The navigational requirement is to have an operable VOR or TACAN receiver or an operable and suitable Area Navigation (RNAV) system. The Class B navigational design basis appears to be in line with 91.131 (a) (2) *"…each person operating a large turbine engine-powered airplane to or from a primary airport for which a Class B airspace area is designated must operate at or above the designated floors of the Class B airspace area while within the lateral limits of that area*". The requirement in the current order is to utilize ground-based NAVAIDs with arcs around them. However, the air traffic system has and continues to evolve and this general approach to Class B airspace design no longer makes sense in a NAS with increased use of GPS navigation and initial decommissioning of legacy NAVAIDs.

Though Class B design has been primarily dependent on a NAVAID, containment within the Class B is in fact a shared responsibility and not completely dependent on a NAVAID. Aircraft operating to and from the primary Class B airport are either on published procedures or radar vectors. In either case, both procedures and air traffic controllers have a requirement to keep traffic contained within the Class B and none are dependent on a cylindrical NAVAID based defined airspace. Furthermore, 14CFR section 91.131 equipment requirements do not apply to those intending to operate outside of Class B and therefore situational awareness of the Class B lateral limits may not be readily identifiable especially if they are not referenced to visible landmarks at all times of the day. Landmarks, NAVAIDs and Waypoints serve more to keep non-participating aircraft outside of Class B airspace despite not having any navigational equipment requirements in place.

Variations in Class B Designs

Simplification and standardization is a prime objective in current guidance and evidenced by the great majority of the Class B designs shaped cylindrically and out to the maximum 30 NM radius. The down side to the strict adherence of this criteria is that it does not consider the strides made in modern navigational technology and does not require consideration of stakeholder needs such as VFR flyways, arrival/departure procedures, nor does it take into account the reality of much increased high performance aircraft to/from satellite airports, etc. However, a paradigm shift has occurred in redesign efforts exercising the seldom used liberty contained in FAAO7400.2 to create irregular Class B designs. Examples include:

- Less cylindrical (SEA, LAX) increased the amount of VFR airspace at the perimeter of Class B
- Include VFR flyways (ATL, LAX) created a passage for VFR traffic within the Class B
- Most designs 10,000 MSL but some are above/below (SLC, DEN, LAS) add needed protective airspace

Recommendations

General Design

Recommendation 8.	**Remove existing guidance indicating design should be centered on a NAVAID and amend guidance to ensure designers leverage the flexibility to configure airspace that maintains Class B safety standards.**

Most Class B designs follow the default cylindrical shape with a maximum 30 NM outer lateral limit and 10,000 foot Mean Sea Level (MSL) vertical height. This appears to be a carryover from legacy TCA designs. However, modern navigational technology has paved the way to appropriately shape airspace in a way that maintains the level of safety while allowing for a more efficient and equitable use of the airspace that considers all stakeholder needs. Some considerations for adjustments to the traditional cylindrical design include airport geometry, arrival/departure procedures, obstacle departure procedure (ODP), Standard Instrument Approach Procedures (SIAP) and terrain.

With the use of modern navigational technology including GPS, and moving maps, the same levels of safety can be maintained through proper identification of the boundaries. Nonstandard configurations could leverage a combination of VOR/DME, Lat/Long, geographic reference points, and RNAV waypoints to define the boundaries.

There should be guidance on when Class-B airspace should deviate from the standardized configuration. This guidance may include existing language in the order that states "…where an operational advantage and safety is maintained, Class-B airspace dimensions can be less than the traditional cylindrical radius".

Although many aircraft operating outside of Class B are known to be using GPS moving map technology to ensure Class B avoidance no assurance exist that this technology is being used 100% of the time. To aid aircraft with all variations of navigational equipment can identify the Class B regardless of design, as much as feasible align boundaries to coincide with prominent landmarks. This would assist aircraft

equipped for pilotage up to Performance Based Navigation (PBN) to increase situational awareness and identify Class B boundaries.

Recommendation 9.	**Require a review of Class B airspace and instrument procedures whenever new runways are built, existing runway changes occur (e.g. decommissioned, lengthened, or shortened) or when procedures are developed or old ones canceled.**

All of the design parameters are thrown into question as traffic patterns change due to the airport geometry, utilization of runways, or as technological advances in aircraft and navigation evolve. When this occurs it would warrant a staff study to evaluate changes and whether any modification is required to the airspace. Such studies should be initiated in time for implementation in conjunction with runway openings or airspace changes.

Recommendation 10.	**Encourage designers to make maximum use of existing tools to accommodate VFR flights through or around Class B airspace**

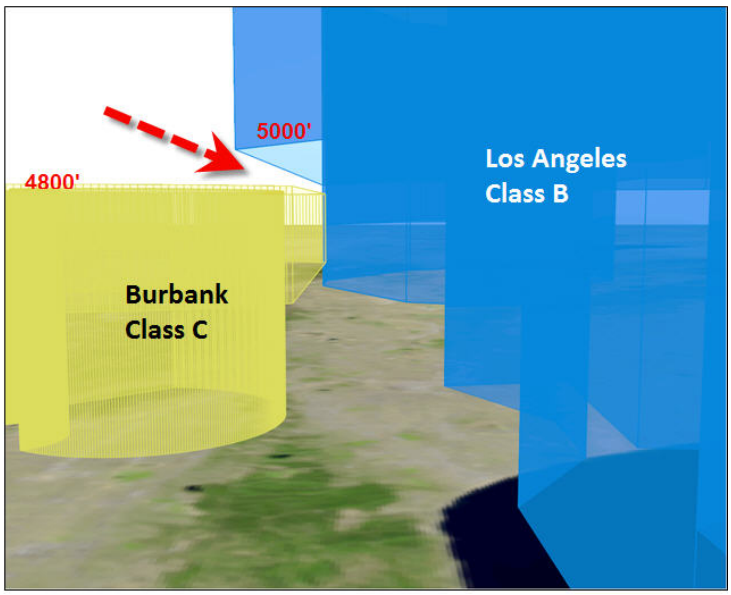
Current guidance for staff study includes guidance on provision of VFR flyways and other mechanisms to access Class B. Such provisions have been underutilized historically and should be given proper consideration in future Class B designs.

Lateral and Vertical Limits

Recommendation 11.	**Evaluate lateral and vertical gaps between adjacent airspace where VFR flight has the potential to increase hazards for Class B or Class C operations.**

Several Class B, Class C, and Class D airspaces are in close proximity either laterally or vertically. By current design criteria, close proximity airspace create lateral or vertical gaps between their respective airspaces which VFR aircraft often fly through without coordinating with Air Traffic Control (ATC), creating a hazard. Examples of this are common throughout the NAS and can be seen at the confluence of the Los Angeles Class B airspace northern boundary where it borders the Burbank Class C airspace. VFR aircraft routinely traverse this area immediately below Class B at 4900’ to avoid the Burbank Class C. See illustration below.

Figure 6 Gap between Burbank Class C and Los Angeles Class B



Procedure and Airspace designers need to be cognizant of unintended lateral or vertical gaps between Class B, Class C, and Class D airspace that encourage VFR aircraft to operate through the lateral margins or between the floor of Class B and Ceiling of Class C airspace.

Recommendation 12. Recommend introduction of an altitude buffer between protected IFR airplanes and VFR aircraft.

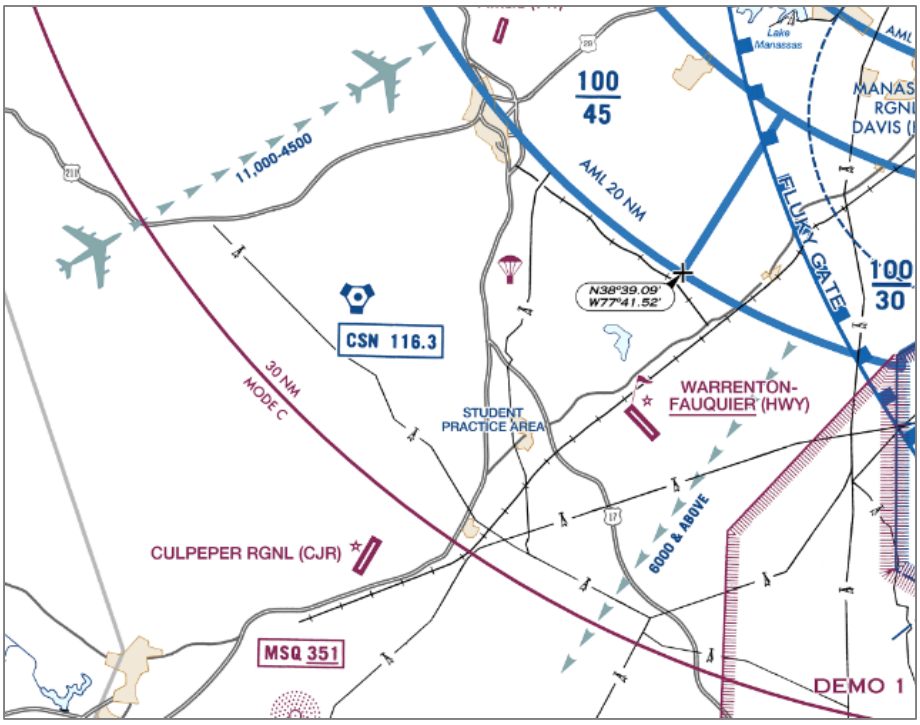
There are known TCAS RA issues between IFR aircraft operating at low altitudes above the base of Class B airspace and VFR aircraft operating at altitudes under the Class B floor. Federal Regulations allow VFR aircraft to fly at any altitude below 3,000 feet AGL up to the floor of Class B airspace. Further, VFR aircraft outside Class B airspace are not required to contact ATC which increases the risk of a mid-air collision with aircraft inside Class B airspace flying procedural altitudes or during climbs and descents.

Procedure and airspace designers should consider establishing an altitude buffer between aircraft operating within and outside of Class B airspace to mitigate the risk of midair collisions and reduce TCAS RA events. Establishing a buffer may require that the altitude of Class B floors will need to change and designers should consider establishing VFR flyways to minimize compressing VFR aircraft transitioning under Class B floors.

Recommendation 13. Ensure all Class B Terminal Area Charts include information on IFR arrival/departure routes to/from the primary airport and explore possibility of extending to include secondary airports.

During the course of the group's deliberations, there was discussion of the possibility that some VFR flights outside of Class B could improve their avoidance of IFR arrival/departure routes if the pilots knew where these are located. Currently the Terminal Area Chart (TAC) for most Class B airspace areas also have a VFR flyway chart that includes these IFR routes. There is benefit for all Class B's as well as secondary airports to include this information.

Figure 7 Washington TAC Chart Depicting IFR Arrival and Departure Routes

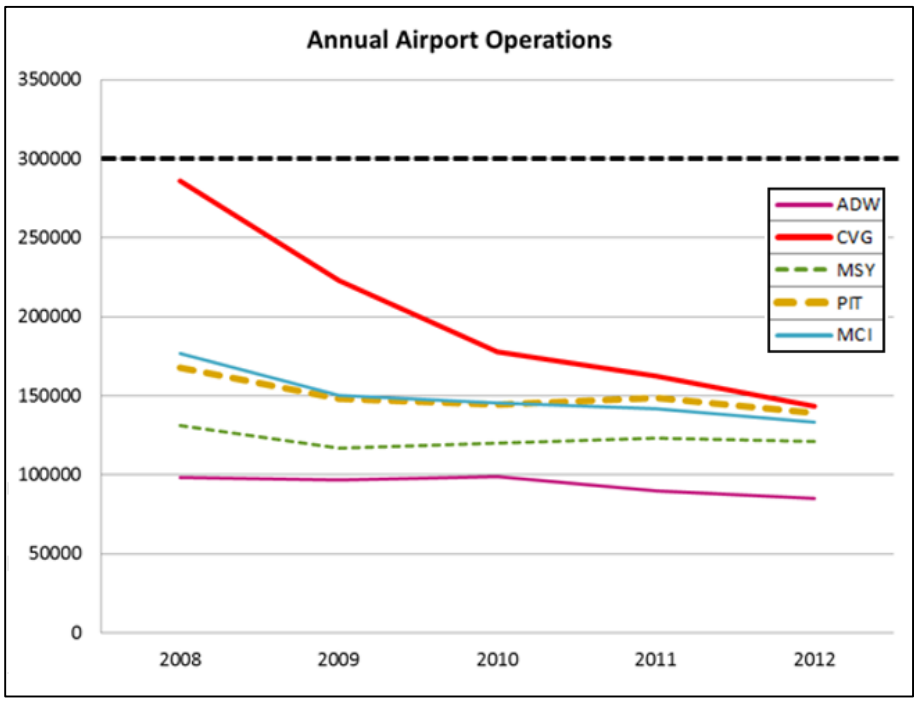


Evaluation Process for Class B Airspace Biennial Reviews

Introduction and Observations

Historically, the airline industry has used the hub and spoke route structure to schedule operations. This resulted in hub airports having a traffic volume significantly above what local demand would support. As the industry has evolved, due to economic fluctuation and airline consolidation, several airports which were formerly hubs have lost that status and have experienced a significant loss of traffic volume. Those that had Class B airspace designation to support their previous volume now fall far below the threshold for establishing a Class B. Figure 8 shows selected airports with the most dramatic drop below the Class B establishment criteria of 300,000 annual operations since 2008. Some of these airports have had annual operations below this threshold since 2006.

Figure 8 Annual Operations for Selected Airports with Class B Airspace



Given that many of these airports do not meet all of the quantitative criteria for establishing Class B airspace, the FAA is considering whether revocation of Class B airspace designation for some of these airports is warranted and in the public interest. Revocation would entail canceling of the existing Class B and replacing with an appropriate class designation. While 7400.2 does acknowledge that Class B airspace can be revoked, the FAA has no experience with taking this action. Therefore, the FAA is requesting comments and recommendations on establishing criteria and a process to revoke a Class B airspace area.

In reviewing Chapter 15, *Class B Airspace*, of FAA Order JO 7400.2, *Procedures for Handling Airspace Matters*, the following captures several recommendations concerning the biennial review process.

Recommendations

The following recommendations to address shortcomings in guidance for the biennial review are provided below.

Recommendation 14. Update FAA Order 7400.2 with additional guidance on data sources relevant for the biennial review.

While FAA Order 7400.2 does provide references to data sources suitable for the administration of Class B airspace, they are only relevant for determining the need for establishing it. Since the FAA Order was first established, the FAA has made significant advances in data analytics that would be relevant to the administration of Class B airspace. The workgroup recommends that the FAA review its data assets and identify those that would support the biennial review's goal of determining whether Class B airspace

should be revoked or modified. Citing them will provide consistency among those offices conducting biennial reviews and will facilitate a more efficient process.

Modifications to Class B airspace boundaries should be informed by safety related data such as Class B excursions, TCAS events, safety issues identified by the FAA's Air Traffic Safety Action Program (ATSAP). Potential data sources useful for assessing if an airport's Class B airspace is still warranted include traffic counts from OPSNET and Terminal Area Forecast (TAF) data which would be help determine whether an airport with low annual traffic counts would be high enough in the future to warrant Class B airspace.

After appropriate data and tools in the FAA have been identified, FAA Order 7400.2 should be updated. Moving forward, as the FAA evolves its data enterprise assets and new data sources and tools are made available, FAA Order 7400.2 should be updated with those that are deemed pertinent to Class B airspace biennial review.

Recommendation 15. Develop criteria for identifying when Class B airspace should be revoked

Chapter 15 of the FAA order is primarily focused on establishing and, to a lesser extent, modifying Class B airspace. While criteria is provided for actions concerning Class B airspace, there are no criteria explicitly identified to determine when an airport no long warrants having Class B airspace. It appears that determining if the airspace should be revoked is left to the discretion of specific regional service area office conducting the biennial review. While this is not inherently flawed, this may lead to inconsistencies in managing these type of situations across the NAS.

In addition to the lack of criteria for identifying when an airport no longer needs Class B airspace, there is no guidance as to how long should the FAA wait before starting the process to revoke the airspace.

It is recommended that FAA Order 7400.2 be updated to provide guidance for when an airport's Class B airspace should be revoked. This guidance should provide

- **A Threshold for when such an action should be considered.** The threshold for revoking an airport's airspace should be set low enough compared to the one for establishment to avoid an airport wavering between requiring Class B and not due to periodic fluctuations in annual numbers. For illustrative purposes, a potential threshold for consideration is an annual operational count that is 80% of what is needed to establish the airspace. The FAA would need to determine the actual threshold value.
- **Guidance on how long the condition must exist before action is initiated**. For illustrative purposes, annual operations need to be below 80% of the annual operations needed for establishment for a period of three years.
- **Guidance on taking into account forecast information**. For example, if the FAA's Terminal Area Forecast (TAF) indicates that annual operations will return to an acceptable level within 3 years then the process for revoking the airspace should not begin.

Recommendation 16. Outline a process for revoking Class B airspace

Given the large percentage of airports with Class B airspace that have operations well below the minima for establishment, the need to provide specific guidance is now more evident. It's recommended that FAA Order 7400.2 be updated to include a process for revoking Class B airspace. In looking to develop a

suitable process, the FAA's current process for establishing Class B airspace may serve as a useful template. Some key aspects of the process for revoking Class B airspace are:

- Identification of stakeholders who should be notified
- A step in which input from relevant stakeholders is collected
- Identification of what would replace the Class B
- Alignment with the FAA's Safety Management System (SMS) requirements for making a change to the NAS
- A review period where the airspace revoked can be assessed to determine whether any safety concerns associated with the change have emerged

Process for External Engagement on Changes to the Class B Guidance

The Task group was requested to provide recommendations to the FAA on the process to gather additional input from the public on any changes to the Order for Class B airspace as well as how to best communicate any changes once they are finalized.

Input to Changes to Class B Guidance

Recommendation 17. Conduct further public engagement before implementation of any design, designation and evaluation changes to Class B guidance.

The following diagram depicts the Task Group's recommendation of how the FAA intends to move forward on implementing changes to the Class B Order:

Figure 9 Recommended Process for Implementation of Updated Class B Guidance

The group anticipates that, based on the findings of this report as well as other effort within the FAA, the FAA will develop a draft change to the Order on Class B airspace, FAA 7400.2. Upon developing such a draft, the group recommends two methods of outreach. First, the Class B Task Group and Tactical Operations Committee has robust participation from a number of membership based organizations in the NAS. The group recommends the FAA collaborate with groups such as the Aircraft Owners and Pilots Association (AOPA), Airlines 4 America (A4A), the Air Line Pilots Association (ALPA), National Business Aviation Association (NBAA),the National Association of State Aviation Officials (NASAO), the National Air Traffic Controllers Association (NATCA), the Regional Airline Association (RAA), and others to enable these organizations to communicate the work of this Task Group and draft changes to the 7400.2 to their membership.

The FAA should also conduct its own informal public outreach after developing a draft change to the Class B guidance. The FAA's public outreach will likely include community meetings. Such meeting are

expected to consist of: an FAA presentation of the intended change to the Class B Order, presentations by members of the public who desire to speak and a question and answer session.

The FAA should consider offering a comment period following the date of the last informal outreach meeting to allow the public to submit any written comments on the proposal. Interactions from the meetings as well as any written comments would serve as input to potential adjustments to the proposed changes to the Class B order. The final draft language of the Class B order would then be published in a Notice of Proposed Rulemaking (NPRM). This would initiate a formal public comment period. The FAA would review and adjudicate all comments. When ready, the FAA would prepare and submit the final rule for publication in the Federal Register.

The process above is modeled off of the current process for designating or redesigning a Class B airspace. Changing the language in the Order, however, is a NAS-level issue as opposed to an airport-level issue for Class B airspace. Hence, the most significant challenge to the FAA in the process depicted above will be effective public outreach on a *NAS level*. The Class B Task Group recommends that the FAA identify an appropriate set of public community meetings to provide sufficient coverage of a cross section of facilities. Additionally, the group recommends that some community meetings be held online for members of the public that wish to participate but cannot attend any of the in-person sessions. All community meetings should be announced in the Federal Register. Additional mechanisms to communicate such meetings to the public are included in the following section of this report.

Communicating Updated Process

Recommendation 18. Whether communicating draft language or a Final Rule of changes to the Class B guidance, the group recommends the FAA utilize one centralized and consistent package of information across all public engagements.

Once a Final Rule is published, the FAA also needs to ensure it is effectively communicating the new information to the public. There are several new approaches being used today to reach out to the flying public beyond standard avenues. It is important to keep in mind that messaging has to be consistent across the National Airspace System, and information should be uniform, therefore the story centralized. In efforts to streamline efforts we would suggest the Federal Aviation Administration (FAA) have one package of information and storyline that goes out to each of the public meetings.

Examples methods to communicate new information are as follows:

- FAA Safety Team (FAAST) Team Representatives – FAA
- FAA website
- “Grass roots” efforts - could include local seminars
- Local Groups - Southern California Airspace Users Working Group (SCAUWG) and others/ pilot associations

- Fly In Events - Sun and Fun, Aircraft Owners and Pilots Association (AOPA) (Fly-In's), Experimental Aircraft Association (Oshkosh), National Business Aviation Association Conference, Helicopter Association International Conference
- Social media - Facebook and Twitter Pages
- Airport Volunteer Network/ local pilots – AOPA
- Digital Magazine/E Pilot- AOPA
- Local flight schools to require instructors to be trained, some kind of sign off sheet
- Have local FOB's attach an information sheet to fuel slips

Examples to communicate in a more traditional way are as follows:

- Reaching out to Fixed Based Operators with informational materials
- Educational meetings for the pilot community
- Educating Flight Standard District Offices and Local ATC with changes

Appendix A: Members of the Class B Group

Chris Baum, Air Line Pilots Association

Marc Henegar, Air Line Pilots Association

Darrell Pennington, Air Line Pilots Association

Robert "Rip" Torn, Air Line Pilots Association

Melissa McCaffrey, Aircraft Owners and Pilots Association

Brian Townsend, American Airlines, Inc.

Hazen Briggs, Federal Aviation Administration

Dan Creedon, Federal Aviation Administration

Gemechu Gelgelu, Federal Aviation Administration

Gary Norek, Federal Aviation Administration

Brenda Stallard, Federal Aviation Administration

Phil Santos, FedEx Express

John Allen, JetBlue Airways

Joe Bertapelle, JetBlue Airways

Chris Stephenson, National Air Traffic Controllers Association

Kim Stevens, National Association of State Aviation Officials

Keith Gordon, National Business Aviation Association

Nat Iyengar, National Business Aviation Association

Bob Lamond Jr, National Business Aviation Association

Blanca Aguado, RTCA, Inc.

Trin Mitra, RTCA, Inc.

Thor Abrahamsen, The MITRE Corporation

Debra Moch-Mooney, The MITRE Corporation

Glenn Morse, United Airlines, Inc.

CDR Joel Doane, US Department of Defense

Bill Reabe, US Department of Defense

Appendix B: Current Designation and Design Guidance for Class B Airspace (7400.2 Chapter 15)

Chapter 15. Class B Airspace

Section 1. General

15–1–1. PURPOSE

a. The primary purpose of a Class B airspace area is to reduce the potential for midair collisions in the airspace surrounding airports with high density air traffic operations. Aircraft operating in these airspace areas are subject to certain operating rules and equipment requirements.

b. Additionally, Class B airspace areas are designed to enhance the management of air traffic operations to and from the airports therein, and through the airspace area.

15–1–2. REGIONAL/SERVICE AREA OFFICE EVALUATION

a. Service area offices must biennially evaluate existing and candidate Class B airspace areas using the information contained in this chapter as a guideline.

b. If the conclusion of an evaluation indicates that airspace modifications should be made, regions/service area offices must follow the applicable procedures in this order.

c. Additionally, any planned modifications to, or establishments of, Class B airspace areas must be coordinated with Airspace Regulations and ATC Procedures Group prior to any public announcement.

Section 2. Class B Airspace Standards

15–2–1. CRITERIA

a. The criteria for considering a given airport as a candidate for a Class B airspace designation must be based on factors that include the volume of aircraft, the number of enplaned passengers, and the type/nature of operations being conducted in the area.

b. For a site to be considered as a new Class B airspace candidate, the following criteria must be met:

1. The primary airport serves at least 5 million passengers enplaned annually;

2. The primary airport has a total airport operations count of 300,000 (of which at least 240,000 are air carriers and air taxi); and

NOTE–
Operation counts are available from the Office of Aviation Policy and Plans, Statistics and Forecast Branch, APO–l10. Enplaned passenger counts may be obtained by contacting the Office of Airport Planning and Programming Division, APP–1. Current validated counts are normally available in mid–October of the current year for the previous year.

3. The Class B designation will contribute to the efficiency and safety of operations, and is necessary to correct a current situation or problem that can not be solved without a Class B designation.

NOTE–
The above is the minimum criteria. It should be noted that when the criteria for the establishment of a Class B airspace area is met, it is merely an indication that the facility is a candidate for further study.

c. Although an airport meets the minimum passenger and air traffic operations criteria for a Class B designation, other factors must be considered, such as: would a Class B designation contribute to the efficiency and safety of operations in the area: and is there a current situation or problem that cannot be solved without the designation of Class B airspace.

15–2–2. DESIGNATION

Class B airspace area locations must include at least one primary airport around which the Class B airspace area is designated.

15–2–3. CONFIGURATION

a. General Design. Simplification of the Class B airspace area configuration is a prime requisite. Its vertical and lateral limits should be standardized and must be designed to contain all instrument procedures within Class B airspace. The number of sub–areas should be kept to a minimum.

b. Lateral Limits. This airspace should be initially designed in a circular configuration centered on the primary airport. Describe the airspace area using NAVAIDs as references where available on the primary airport in the following order of preference: VORTAC, VOR/DME, etc.

1. The outer limits of the airspace must not exceed a 30 NM radius from the primary airport.

2. This 30 NM radius will generally be divided into three concentric circles: an inner 10 NM radius, a middle 20 NM radius, and an outer 30 NM radius.

3. The inner 10 NM radius area may be subdivided based on operational needs, runway alignment, adjacent regulatory airspace, or adjacent airports.

4. The areas between 10 to 20 NM and 20 to 30 NM may be vertically subdivided because of terrain or other regulatory airspace.

c. Vertical Limits. The upper limit of the airspace normally should not exceed 10,000 feet MSL. The inner 10 NM area must normally extend from the surface to the upper limits of the airspace. This segment may be adjusted to coincide with runway alignment, adjacent airports, other regulatory airspace, etc., but must encompass, as a minimum, all final approach fixes and minimum altitudes at the final approach fix. The floor of the area between 10 and 20 NM must be predicated on a 300–foot per NM gradient for 10 NM. This segment will normally have a floor between 2,800 feet and 3,000 feet above airport elevation. This floor must remain constant for that segment, but may be adjusted considering terrain and adjacent regulatory airspace. However, segmentation should be held to an absolute minimum. The floor of the area between 20 and 30 NM must be at an altitude consistent with approach control arrival and departure procedures. It is expected that this floor would normally be between 5,000 and 6,000 feet

above airport elevation. In the segment between 20 and 30 NM, exclusions are permitted to accommodate adjacent regulatory airspace and/or terrain.

d. Variations. Any variation from the standard configuration must be addressed in the staff study.

e. Satellite Airports. When establishing the airspace floor, consider the adverse effect on satellite airport operations as well as operations at the primary airport. When airspace directly over a satellite airport is not required, it should be excluded from the Class B airspace. Special published traffic patterns and/or procedures may be required for satellite airports.

Section 3. Class B Airspace Processing

15–3–1. RESPONSIBILITIES

a. The Airspace Regulations and ATC Procedures Group Manager is responsible for oversight of the Class B airspace designation/modification process. All NPRMs and final rules must be issued by Airspace Regulations and ATC Procedures Group. Airspace Regulations and ATC Procedures Group will provide assistance, as needed, to the regions/service area offices in developing Class B airspace actions.

b. The service area office is responsible for coordination to determine Class B airspace candidacy, or the need for modifications to an existing area. As part of this responsibility, the service area office must perform an analysis of the Class B airspace candidate and document the analysis in a staff study. Preparation of the staff study may be delegated to the facility.

15–3–2. STAFF STUDY

The staff study must be in the format detailed in FAAO 1800.2, Evaluations, Appraisals, and Staff Studies. At a minimum, the staff study must include the following:

a. A written description and the graphic depiction of the proposed area.

b. Graphic depiction(s) and analysis of the following:

1. Existing routes with associated altitudes that VFR traffic use while operating en route through the area or transitioning to all affected airports (charted VFR flyways).

2. Proposed VFR Flyways, with associated altitudes that would be charted to accommodate VFR aircraft desiring to transit the Class B airspace area (see FAAO 7210.3, chapter 11, National Programs).

3. A redundant boundary description including VOR/DME and latitude and longitude points outlining the proposed Class B area. In addition, where possible, include geographical features.

4. Routes with associated altitudes that IFR traffic use to conduct en route operations through the area being analyzed.

5. IFR departure and arrival traffic flows, including SIAPs, instrument departure procedures, STARs, and preferential arrival and departure routes associated with each runway configuration.

c. A narrative discussion and rationale of the following:

1. Number of aircraft based and types of operations conducted at affected airports.

2. Numbers of VFR operations that receive ATC service, that are denied service, and that circumnavigate the present terminal airspace configuration. Include any anticipated increase or decrease in these numbers if a Class B airspace configuration is modified or so designated.

3. Average delay in minutes now experienced by VFR operations in obtaining ATC services, and any anticipated increase or decrease in this number.

4. The facility's ability to provide ATC service to IFR and VFR traffic within the boundaries of its delegated airspace.

d. Analyses of staffing options, and issues, such as:

1. Current staffing status and the anticipated staffing requirements for implementing the Class B airspace.

2. Major proposals/comments submitted by user groups and an analysis and/or disposition of each.

3. Impact on air traffic and air navigation facilities including new or modified control positions required, if any, and new or relocation of navigational aids/communication equipment.

e. Environmental considerations.

f. Conclusions. Include a discussion on how the proposed establishment or modification will enhance safety and the efficiency of airspace management.

15–3–3. AIRSPACE USERS COORDINATION

a. Pre–NPRM. The service area office must ensure that user input is sought and considered prior to formulating any planned Class B airspace area design.

1. An ad hoc advisory committee, composed of representatives of local airspace users, must be formed to present input or recommendations to the FAA regarding the proposed design of the Class B airspace area. The service area office should provide advice and assistance on technical matters to the committee as needed.

2. Informal airspace meeting(s) must be conducted in accordance with Chapter 2 of this order.

3. Based on the results of the region's analysis and the staff study, the service area office must determine whether the effort should be continued to NPRM or terminated. The service area office will forward the proposal, all pertinent documentation (including advisory committee and informal airspace meeting input), and the region's/service area office's recommendations, to Airspace Regulations and ATC Procedures Group for further action. If it is determined to proceed with the rulemaking process, Airspace Regulations and ATC Procedures Group will prepare the NPRM.

b. Post–NPRM. The service area office must:

1. Review all comments received in response to the NPRM and informal airspace meeting(s).

2. Coordinate with the concerned facility to address all substantive aeronautical comments.

3. Forward a discussion of how each substantive comment was addressed, along with the region's/service area office's recommendation for final action on the proposal, to Airspace Regulations and ATC Procedures Group.

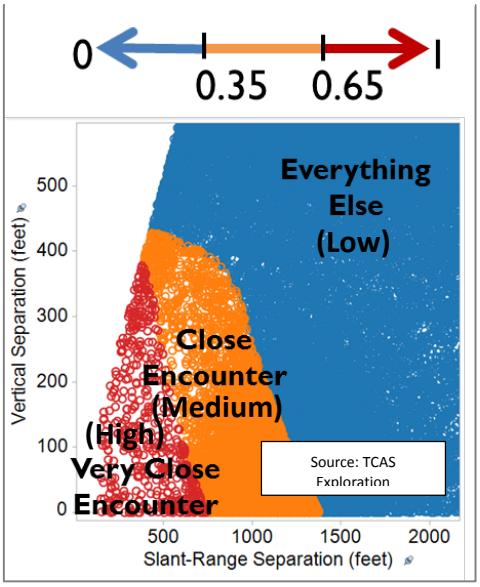
Appendix C: Description of TCAS Exploration Display (TED) Analysis

TED was developed by MITRE CAASD's Aviation Safety Information Analysis and Sharing (ASIAS) program. It identifies encounters that likely triggered a TCAS RA based on National Offload Program (NOP) radar surveillance data and the TCAS II Version 7.0 logic simulator. TCAS II is required on any turbine-powered aircraft of more than 33,000 pounds or any passenger aircraft with more than 30 seats (Code of Federal Regulations (CFR) Title 14 Part 121.356). TED provides approximation of TCAS behavior and evaluates proximity based on TCAS thresholds where both range and vertical thresholds must be exceeded to trigger an alarm. Figure 10 shows is an example of the tool output and features TCAS RAs triggered on arrival to KLGA.

Figure 10 TCAS Exploration Dashboard, September 2013

The simulated TCAS RA data are categorized by risk level, which align with the FAA TCAS RA risk levels. Three risk levels are considered: low, medium and high.The focus of the analysis was on the more serious high and medium risk events, but the analysis also considered low risk events as potential indicators of emerging trends. The minimal risk events were not analyzed as they tend to be "nuisance" RAs that generally are not separation violations. Figure 11 llustrates the values associated with TCAS separation.

Figure 11 Risk Assessment Levels for TCAS RAs



Appendix D: FAA Tasking Letter

U.S. Department
of Transportation
**Federal Aviation
Administration**

Mission Support Services
800 Independence Avenue, SW.
Washington, DC 20591

NOV 21 2014

Ms. Margaret T. Jenny
President
RTCA, Inc.
1150 15th Street, NW, Suite 910
Washington, DC 20036

Dear Ms. Jenny:

The Federal Aviation Administration (FAA) is responsible for establishing Class B airspace areas to reduce the risk of midair collision in the airspace surrounding airports with high density air traffic operations. Airspace standards are set under FAA JO 7400.2, Procedures for Handling Airspace Matters. FAA Service Area offices complete evaluations on existing and candidate Class B airspace areas using the information contained in Chapter 15 as a guide. When the criteria for the establishment of a Class B airspace area is met, it is merely an indication that the facility is a candidate for further study.

The evaluation and resulting determination to proceed with rulemaking is completed prior to any public announcement. To ensure the best possible outcome is reached for all stakeholders, the FAA is considering updating the evaluation requirements to better identify when further action is needed. It is the intent to provide a more thorough analysis of the available information as early in the evaluation process as possible. This necessitates a more detailed list of designation requirements used when evaluating existing and candidate Class B airspace areas.

We believe the Tactical Operations Committee (TOC) can provide valuable feedback for consideration to help the FAA ensure that any changed processes benefit the safe and efficient management of the National Airspace System. The goal is to establish a process that ensures airspace designations and design are commensurate with the risks involved with high volume mixed VFR/IFR operations while maximizing airspace efficiency and access. Committee feedback will help the FAA establish clear guidelines regarding the need to establish, as well as, verify, plan, and implement changes to Class B airspace areas. Specifically, the FAA requests comment and recommendations on the following:

- Class B airspace designation requirements.
- Appropriate considerations for Class B airspace design criteria.
- The evaluation process for airspace biennial reviews including criteria to expeditiously reduce or eliminate Class B sirspace that no longer meets designation requirements.
- Obtaining input from affected users as early in the process as possible.
- Identifying the best mechanism(s) to communicate updated processes to key stakeholders.

The FAA will provide Subject Matter Experts for this task as needed. To ensure that the TOC considers all relevant issues, the Task Group should, at a minimum, include airport operators, aircraft operators (airlines, pilots, and general aviation), and state aviation officials.

We seek the TOC's recommendations on the items at the 3rd Quarter FY 2015 TOC meeting. Once the task team is established, we will work with TOC Leadership to determine if interim reporting deliverables and milestones are appropriate. Once the task is complete, the Agency will consider the committee's recommendations for potential changes to existing processes.

Sincerely,

Elizabeth L. Ray
Vice President, Mission Support Services
Air Traffic Organization