



**Federal Aviation
Administration**

Updated Response to
Oakland Airport-Community
Noise Management Forum's Recommendations

August, 2018

Executive Summary

The Northern California airspace is very complex, with traffic arriving and departing from several major airports, smaller regional airports and military facilities. All arrival and departure procedures within the Northern California airspace are interconnected and interdependent, and were designed to improve safety and efficiency within the National Airspace System (NAS). Longstanding issues with, as well as changes to, instrument approach and departure procedures have generated noise concerns from some San Francisco Bay Area residents.

On March 24, 2017, the Oakland Airport-Community Noise Management Forum (OAK Noise Forum) presented the FAA with a 73-page report containing 34 recommendations and 3 process questions (see “conclusion”). The 34 recommendations ask the FAA to identify and adjust 6 specific procedures and/or relocate specific waypoints. The OAK Noise Forum’s requested changes involve the following:

- San Francisco International Airport (SFO):
 - o 2 Area Navigation (RNAV) Standard Instrument Departures (SIDs) [NIITE and TRUKN];
- Oakland International airport (OAK):
 - o 2 RNAV SIDs [CNDEL and HUSSH];
 - o 1 RNAV Standard Terminal Arrival (STAR) [WNDSR]; and
 - o 1 legacy, conventional SID (Referred to as OAKLAND NINE, currently OAKLAND THREE)

The OAK Noise Forum’s submittal also asked the FAA for the estimated timeline and methodology for evaluating proposed procedures and the associated noise on underlying communities. Further, on November 21, 2017, U.S. Representative Barbara Lee (CA-13) requested that the FAA provide an interim response to the recommendations.

The FAA conducted a detailed analysis and a preliminary feasibility study of the OAK Noise Forum’s proposed recommendations. The study focused on flight procedures criteria and the flyability of the proposed routes. The FAA has also assessed impacts the proposals could have on operations at surrounding airports and on air traffic control procedures that serve those airports. After conducting these analyses and assessments, the FAA has determined that it has already addressed 6, and is further considering 2 of the OAK Noise Forum’s recommendations. The FAA cannot support 26 of the OAK Noise Forum’s recommendations, and has answered the 3 process questions.

Although there is no legal requirement to do so, the FAA remains willing to address community noise concerns. As a result, the FAA undertakes its community outreach efforts and considers potential adjustments to address community noise concerns while remaining mindful that all arrival and departure procedures within the Northern California airspace are interconnected,

interdependent and designed to improve safety and efficiency within the NAS. If the FAA determines a new requested procedure is initially feasible, flyable, and operationally acceptable from a safety point of view, the proposal constitutes a new federal action. The FAA will conduct its formal environmental and safety reviews, and its enhanced community outreach, as appropriate.

The FAA is committed to continue working collaboratively with the OAK Noise Forum, as well as communities and members of Congress, to address a wide range of noise concerns. However, the agency's willingness to work collaboratively, including participating in meetings, does not reopen the FAA's August 7, 2014 Environmental Assessment or its August 7, 2014 Final Decision for the Northern California Optimization of Airspace and Procedures in the Metroplex (NorCal OAPM). The FAA's August 7, 2014 Record of Decision constituted a final order of the Administrator subject to review by the Courts of Appeals of the United States in accordance with the provisions of 49 U.S.C. section 46110.

In November 2014, the FAA began its phased implementation of the NorCal OAPM—optimized standard arrival and departure instrument procedures serving air traffic flows into and out of the four study airports: San Francisco International Airport (SFO), Oakland International Airport (OAK), Mineta San Jose International Airport (SJC) and Sacramento International Airport (SMF). The NorCal OAPM did not require any ground disturbance or increase in the number of aircraft operations within the Northern California Metroplex area. In total, the General Study Area included 11 entire counties and portions of 12 partial counties. There are 84 procedures included in the NorCal OAPM, including 32 new Area Navigation (RNAV) procedures (18 new RNAV Standard Instrument Departures (SIDs) and 14 new RNAV Standard Terminal Arrivals (STARs). In addition, 28 conventional SIDs, 22 conventional STARs, and 2 RNAV STARs are carried forward as part of the NorCal OAPM. The FAA began its phased implementation of its 32 new RNAV procedures in November 2014 and concluded April 30, 2015.

Table of Contents

Introduction	5
National Environmental Policy Act	5
Timelines	6
FAA Response	9
1. HUSSH	9
2. WNDSR	17
3. OAKLAND 9	21
4. CNDEL	24
5. NIITE	26
6. TRUKN	28
7. CONCLUSION (3 Process Questions)	33

INTRODUCTION

The Port of Oakland, owner and operator of the Oakland International Airport (OAK), has shared the “*Oakland Airport - Community Noise Management Forum (OAK Noise Forum) March 24, 2017 Recommendations*” with the Federal Aviation Administration (FAA). The OAK Noise Forum’s recommendations identify specific procedures: one arrival from the Northeast, one nighttime departure procedure and one departure from San Francisco International Airport (SFO). The OAK Noise Forum’s recommendations also seek the FAA’s help to use new area navigation (RNAV) procedures to move flights away from populated areas.

The OAK Noise Forum identifies its March 2017 recommendations as, “Supplemental Proposals to Revising the Northern California Metroplex for Alameda County/Contra Costa County” (pg.5-45) and includes the following six attachments:

- Attachment A is the “Alameda County/Contra Costa County Proposals Summary Table” (pg. 46-51);
- Attachment B is the July 26, 2016 Oakland City Council air craft noise resolution (pg. 52-55);
- Attachment C is the September 27, 2016 Berkeley City Council aircraft noise resolution (pg. 56-59);
- Attachment D is the March 8, 2017 Alameda City Council aircraft noise resolution (pg. 60-63);
- Attachment E is Alameda County Supervisor, Nate Miley’s February 28, 2017 letter to FAA (pg. 64-66);
- Attachment F is the City of Oakland’s February 27, 2017 letter to FAA (pg. 67-69);
- Attachment G is the March 6, 2017 San Leandro City Council aircraft noise resolution (pg. 70-72)

The FAA has conducted a detailed analysis and a preliminary feasibility study focusing on flight procedure criteria and overall flyability of the OAK Noise Forum’s proposed new Performance Based Navigation (PBN) procedures, potential procedural modifications including speed/altitude adjustments, airspace changes and possibility of moving existing waypoints. The FAA also completed an assessment of impacts that the proposals would have on operations at the surrounding airports and associated procedures.

National Environmental Policy Act

In addition to its mandate to ensure the safe and efficient use of the NAS, the FAA complies with the requirements of the National Environmental Policy Act (NEPA). Although not specifically detailed within this response, the FAA will follow its processes and standards for evaluating noise impacts associated with potential proposed amendments to currently published procedures—consistent with FAA Order 1050.1F (effective July 16, 2015)—before implementing any airspace

or procedure changes. Further, even though there may be no legal requirement to do so, the FAA will undertake its enhanced community outreach efforts, as appropriate.

Despite the OAK Noise Forum's characterization of its recommendations as "Supplemental Proposals to Revising the Northern California (NorCal) Metroplex for Alameda/County/Contra Costa County," its March 2017 recommendations, including Attachments A through G, do not reopen the FAA's August 7, 2014 final decision for the NorCal OAPM. This document does not constitute either a final decision of the FAA or a reopening of the FAA's August 7, 2014 final decision for the NorCal OAPM.

Timelines

This updated response provides guidelines for the recommendations presented in the OAK Noise Forum's March 2017 report. These timelines incorporate a number of established Federal processes and sub-processes. To best understand why the FAA determined the presented timelines, some background to these processes is necessary. This section provides that background.

Non-Rule Making:

Non-rule making processes do not result in the amendment to any Code of Federal Regulations (CFR) or amend any other document which is included by reference in a CFR.

- a. Air Traffic Facility Actions: These actions provide specific directions for the local air traffic control facility. These actions *could be* a change to a facility's Standard Operating Procedures (SOP), to Letter of Agreements (LOA) between facilities or part of regular Air Traffic Controllers training to increase awareness of certain issues.

The steps are as follows:

- Initial proposal: The Air Traffic Facility proposes an amendment to their SOP, to an LOA with another Air Traffic Facility or training requirements. This initial proposal is vetted within the Air Traffic Facility.
Timelines: few weeks for training proposal.
1 – 8 months for an SOP change.
1 – 18 months for an LOA change.
- The LOA is sent for review and approval.
Timelines: few weeks.

Total time: a few weeks – more than 1 year.

- b. Creation/Amendment of an instrument flight procedure: Amending or creating a new instrument flight procedure is an example of a non-rule making process. Given the variables involved with each of the following steps, the timelines provided are only intended on capturing the average time taken for each step. Although not specifically referenced within the following section and even if there is no legal requirement to do so, the FAA remains willing to address community noise concerns. As a result, the FAA undertakes its community outreach efforts and considers potential adjustments to address community noise concerns while remaining mindful that all arrival and departure procedures within the Northern California airspace are interconnected, interdependent and designed to improve safety and efficiency within the National Airspace System (NAS). To the extent the FAA determines a new requested procedure is initially feasible, flyable, and operationally acceptable from a safety point of view, then the FAA will conduct its formal environmental and safety reviews for this new federal action.

The steps in the instrument flight rules procedure processes are as follows:

- Initial Feasibility/Analysis of the procedure. The proponent of the procedure does initial research into the details and justifications for the new/amended procedure. This stage is completed once the proponent places the request and the associated justification into the IFP Information Gateway.
Timeline: 45 days.
- FAA Order 7100.41A: Performance Based Navigation (PBN) processing: This is the required process for all new and amended: PBN procedures and/or routes, Area Navigation (RNAV)/Required Navigation Performance (RNP), Standard Instrument Departures (SIDs), RNAV Standard Terminal Arrivals (STARs) and RNAV routes. The FAA Order 7100.41A breaks down the design and implementation process into 5 stages:
 - o Preliminary Activities: This includes a baseline analysis to identify expected benefits and develop conceptual procedures and/or routes for the proposed project.
 - o Design Activities: This includes the creation of a working group in order to design a procedure/route that meets the project goals and objectives. An environmental review is included in this stage.
 - o Development and Operational Preparation: The intent of this stage is to complete all pre-operational items necessary to implement the procedures and/or routes. This phase includes training, issuing notifications, automation, updating radar video maps, and processing documents. This phase ends when procedures and/or routes are submitted for publication.
 - o Implementation: The purpose of the implementation phase is to implement the procedures and/or routes as designed. This phase starts with confirmation by the Full Working Group (“FWG”) that all required pre-

implementation activities have been completed and ends when the procedures and/or routes are published and implemented.

- o Post-Implementation Monitoring and Evaluation: The purpose of the post-implementation monitoring and evaluation phase is to ensure that the new or amended procedures and/or routes perform as expected and meet the mission statement finalized during the design activities phase. Post implementation activities include collecting and analyzing data to ensure that safe and beneficial procedures and/or routes have been developed.

Timeline: > 1 year.

- Regional Airspace and Procedure Team (RAPT) review: If approved, the RAPT assigns a priority for the project and a proposed chart date. Due to existing charting requirements, as well as the demand for NextGen procedures, there are currently projected charting dates scheduled through 2024.

Timeline: 30 days.

- Development of proposed chart: This is the actual preparation of the chart/s.

Timeline: 45 days.

- Quality Control Review:

Timeline: Variable.

- Project is coded for Flight Management Systems:

Timeline: 10 days.

- Flight Inspection:

Timeline: 50 days.

- Flight Standards Review: this is only required for some procedural development projects.

Timeline: 21 days.

- Proposed Procedure/s are sent for publication and distribution:

Timeline: 38 to 60 days.

Total time: >1.5 years.

FAA Response

HUSSH SID

- 1.1 **"The short-term solution would be for Air Traffic Control to assign headings to aircraft departing OAK runway 30 that restore the initial SILENT ground track."**

Reference: OAK Noise Forum Recommendations Page 13

Explanation: The FAA cannot support this recommendation for the following reasons. The SILENT Standard Instrument Departure (SID) is a conventional procedure that uses ground-based navigation. While the SILENT SID is still a published procedure, it has largely been replaced by the HUSSH SID, which is an RNAV procedure that uses satellite-based navigation and provides much greater precision. The OAK Noise Forum's recommendation to restore the conventional SILENT SID ground track may provide minor relief from noise concerns on the east side of the Bay, but a return to the SILENT SID ground track will create significant noise concerns for the San Francisco area. As illustrated in Figure 1 below, the HUSSH SID (green) is generally in the middle of the Bay until the REBAS waypoint (not pictured). The SILENT SID (orange), however, averages within 0.5 NM of downtown San Francisco.

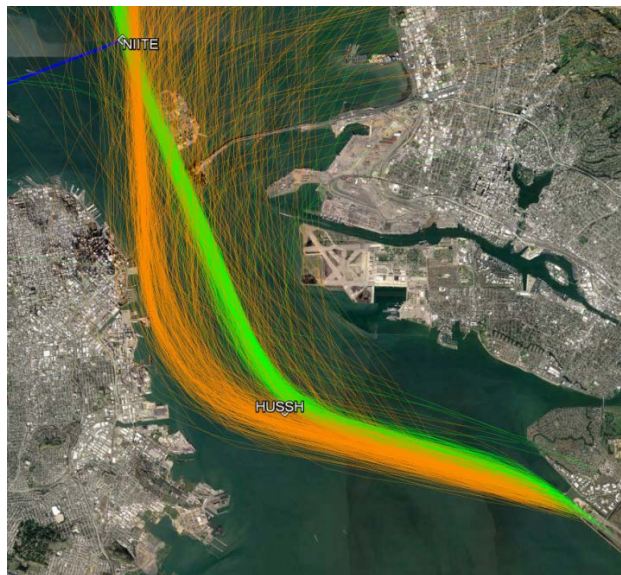


Figure 1 - Comparison of SILENT (orange) and HUSSH (green) ground tracks.
NOTE – Tracks not assigned these SIDs have been removed for clarity.

The purpose of the NorCal OAPM project was to design procedures that enhance the safety and efficiency of the airspace and optimize flight tracks. When designing a new procedure, one of the primary goals is to procedurally separate it from other procedures. That is, when an aircraft flies the procedure, FAA separation minima around that aircraft

is guaranteed throughout the procedure. However, the close proximity of the SFO and OAK airports, with the inclusion of Noise Abatement procedures, precludes that goal. During Noise Abatement hours, OAK departures on the HUSSH or SILENT SID fly westward over the Bay to approximately the HUSSH waypoint before turning North. This brings those aircraft in close proximity to one of SFO's primary departure procedures, the SSTIK SID (see Figure 2 below). This close proximity means procedural separation between the HUSSH / SILENT SIDs and the SSTIK SID does not exist, requiring the coordinated release of all aircraft flying these procedures. This coordination causes significant ground delays at both airports. Modifying the HUSSH SID to replicate the path of the SILENT SID will exacerbate the problem (i.e., delays) as it would move the two procedures closer together.

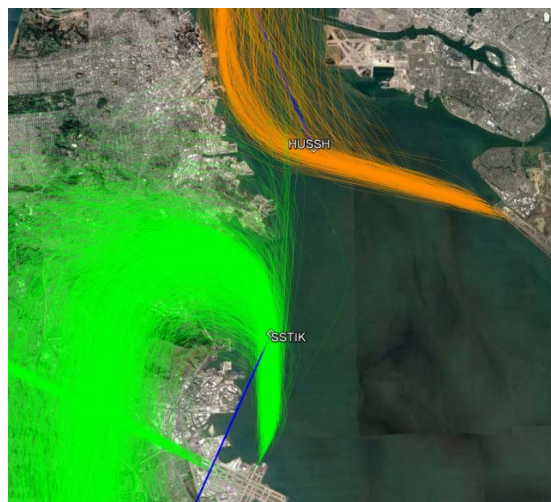


Figure 2 – SSTIK (SFO - Green) and SILENT (OAK - Orange) SIDs.

NOTE – OAK tracks that appear to have been assigned runway heading to join the SILENT SID further north have been removed for clarity.

- 1.2 “Additionally, the FAA should ensure aircraft remain on their filed route and not turn prior to REBAS intersection and secure a decreased level of night-time noise by issuing an FAA memorandum of understanding with ATC to keep aircraft on the route as published to the REBAS intersection unless safety dictates otherwise.”**

Reference: OAK Noise Forum Recommendations Page 13

Explanation: The FAA considers this recommendation addressed for the following reasons. A similar recommendation was made by the SFO Roundtable in its November 2016 *Response to the FAA Initiative to Address Noise Concerns*. The Northern California Terminal Radar Approach Control (NCT) implemented this recommendation by Notice on February 21, 2017 and has since become part of the Standard Operating Procedures (SOP). NCT understands the impact that turning aircraft prior to REBAS has on the East Bay Communities and will continue to monitor this restriction for compliance.

It should be noted that an increase in reportable aircraft delays has been observed. As aircraft cannot be vectored off the procedure to establish lateral separation sooner, this restricts how quickly aircraft may be released from the airport in order to achieve the necessary aircraft-to-aircraft separation. This has contributed to a significant increase in departure delays at both airports. For example, in June 2016, before the restriction was implemented, OAK and SFO combined experienced one reportable ground delay during the Noise Abatement Procedure (NAP) times (a reportable delay is one of 15 minutes or more). In June 2017, with the restriction in place, the number of reportable delays rose to 103 during the same NAP times (there were 601 reportable delays, averaging 22 minutes, during August 2017).

1.3 “...evaluate the HUSSH procedure and adjust it to replicate the SILENT SID ground track and require aircraft to fly to REBAS unless safety dictates otherwise and adjust the REBAS intersection offshore to keep aircraft over the water instead of turns over land.”

Reference: OAK Noise Forum Recommendations Page 13

Explanation: This recommendation contains three distinct recommendations, two of which have been responded to in other sections. Please refer to OAK Noise Forum Recommendation 1.1 for more information about replicating the SILENT SID ground track. Please refer to OAK Noise Forum Recommendation 1.2 for more information about requiring aircraft to fly to REBAS. This recommendation’s “Explanation” refers to the third recommendation – adjust the REBAS intersection offshore to keep aircraft over the water instead of turns over land.

The FAA cannot support this recommendation for the following reasons. Moving the REBAS waypoint west of its current location would jeopardize safety because it removes the requisite separation. As illustrated in Figure 3 (below), the REBAS waypoint is a fly-by waypoint, meaning aircraft are not required to overfly the waypoint. Rather, the aircraft’s Flight Management Software (FMS) will calculate when to start its turn prior to REBAS (based upon weather, aircraft performance, weight, etc.) so the aircraft smoothly joins the next leg of its route.

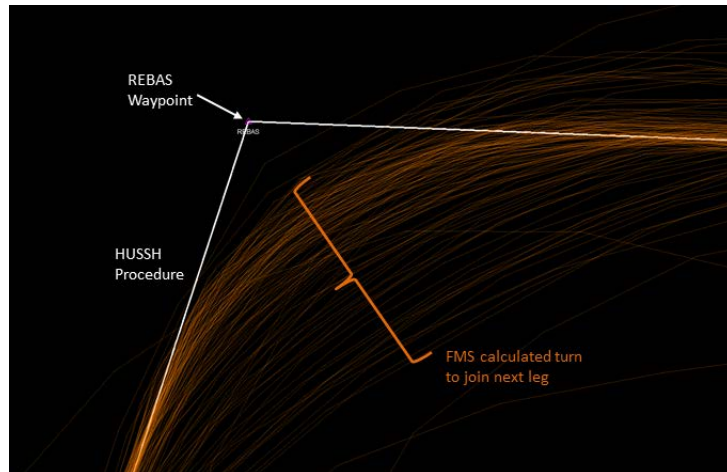


Figure 3 – For clarity, only the TIPRE / SYRAH transitions to TAMMM are shown, as well as tracks for those transitions.

Air traffic procedures are designed to be procedurally separated from other procedures. As illustrated in Figure 4 (below), the REBAS waypoint is 6 miles east of the BRIXX arrival procedure.



Figure 4 – REBAS intersection on the HUSSH SID (Orange) is 6 NM east of BRIXX STAR (Green)

1.4 “...moving HUSSH waypoint southward as much as feasible to facilitate a sharper left turn by aircraft after departing OAK runway 30”

Reference: OAK Noise Forum Recommendations Page 13

Explanation: The FAA cannot support this recommendation for the following reasons. The RNAV HUSSH SID provides far greater precision and predictability than the ground-based, conventional SILENT SID, because its course guidance is satellite based (RNAV) and not reliant on a radio signal. In order to take advantage of the satellite-based RNAV procedures, an aircraft's navigational equipment must have the precision to keep the aircraft within one nautical mile of the centerline of the procedures. The route width for conventional, ground-based procedures (such as the SILENT SID) is variable from 1.8 to 4 NM, depending on the design. In actual flight operations using modern advancements in navigation equipment, aircraft remain well within these tolerances (in some cases, within .3 NM for RNAV procedures). Figure 5 (below) illustrates an RNAV procedure's greater precision. Keeping the tolerance requirements in mind, the green line represents the RNAV HUSSH SID, while the red shaded area represents the conventional SILENT SID, which is much less precise.



Figure 5 - SILENT vs. HUSSH SIDs.

Part of the ability for aircraft to remain this close to the route centerline(s) is the calculation of the turn from one segment to another. Current procedure design criteria preclude the use of “fly-over” waypoints in lieu of “fly-by” waypoints without an identified operational/safety advantage. As such, for turns similar to that of the HUSSH waypoint on the HUSSH SID, the aircraft does not actually pass over the waypoint. Rather, each aircraft’s flight management system calculates the most effective turn that will balance the amount of time that the aircraft is not over a route centerline but is still

within aircraft/airline flight profile limits. Generally speaking, the more acute the angle is between two route segments, the greater the divergence will be from the waypoint. This is illustrated in Figure 6; the segment angle at HUSSH is 130°.

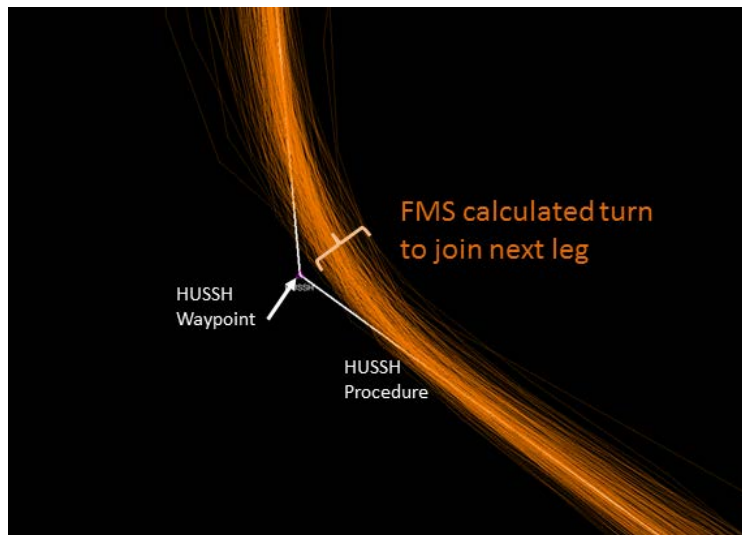


Figure 6 - HUSSH procedure (White) and HUSSH departure tracks (Orange), illustrating FMS calculated turn.

This characteristic of RNAV SID procedures would preclude any benefit to the modification of the HUSSH waypoint. By moving the waypoint to the south, the turn required to join the next segment to NIITE would not have a noticeable impact to the flight tracks over the ground.

An additional consideration, and as stated in OAK Noise Forum Recommendation 1.1, OAK departures on the HUSSH are in close proximity to one of SFO's primary departure procedures, the SSTIK SID. This close proximity means procedural separation between the HUSSH and the SSTIK SID does not exist, requiring the coordinated release of all aircraft flying these procedures. Moving the HUSSH waypoint southward will exacerbate delays as it would move the two procedures closer together.

- 1.5 **“...regulate and eliminate turns off of HUSSH prior to REBAS intersection and secure a decreased level of night time noise by creating a memorandum of understanding with ATC to keep aircraft on the route as published to the REBAS intersection for published noise abatement procedures unless safety dictates otherwise.”**

Reference: OAK Noise Forum Recommendations Pages 13, 14

Explanation: The FAA has addressed this recommendation. Please refer to OAK Noise Forum Recommendation 1.2 for more information about requiring aircraft to fly to REBAS.

- 1.6 “...moving the location of REBAS over the Bay to mitigate noise from concentrated traffic turning eastward over communities in the Point Richmond area.”**

Reference: OAK Noise Forum Recommendations Page 14

Explanation: The FAA cannot support this recommendation. Please refer to OAK Noise Forum Recommendation 1.3 for more information about moving the REBAS waypoint.

- 1.7 “...adjusting night time hours for noise abatement operations from the current 2200-0700 local time Monday through Saturday, 2200-0800 local time on Sunday to new night time hours of noise abatement procedures of 2100-0800 local time daily, seven days a week for relief as flight curfews are not an option”**

Reference: OAK Noise Forum Recommendations Page 14

Explanation: The FAA is willing to work with the airports (SFO and OAK) and the airlines, to determine if Noise Abatement Procedures (NAP) can be amended. Noise abatement procedures, including mandatory issuance of the HUSSH SID, are currently in effect from 2200 – 0700 Local Time Monday through Saturday and 2200 – 0800 Local Time on Sundays. While the NAP times appear rigid, in actuality they are dependent upon aircraft operations. Aircraft scheduling (which is set by the airlines), aircraft delays due to weather at their departure airport or en route, and other factors play a role in determining when aircraft operations decrease to a level where NAP can be safely begun and ended.

A related recommendation that has already been implemented - keeping aircraft filed on the NIITE / HUSSH until REBAS waypoint (except for safety considerations) - has resulted in an increase in delays at the SFO and OAK airports (please refer to OAK Noise Forum Recommendation 1.2 for information). Increasing the NAP hours has the potential to further increase those delays, both in time and in number of aircraft.

- 1.8 “...as OAK departures over Berkeley and Oakland are lower in altitude and markedly louder than SFO departure, implement the adjusted HUSSH procedure all the way to REBAS and then onto the next fix for all northerly OAK departures from Runway 30 so that the HUSSH DP is in effect 24 hours a day for these flights instead of only at night to decrease the noise burden on Oakland, Emeryville, Berkeley, Albany, and Kensington.”**

Reference: OAK Noise Forum Recommendations Page 14

Explanation: This recommendation contains two distinct recommendations, one of which is very similar to a recommendation responded to in another section. Please refer to OAK Noise Forum Recommendation 1.2 for more information about requiring aircraft to fly to

REBAS. This recommendation adds, "...and then onto the next fix for all northerly OAK departures..." As with OAK Noise Forum Recommendation 1.2, the FAA has addressed this concern for the following reasons: An analysis of track data was performed with the following results for aircraft that filed either the NIITE or HUSSH SID and passed within 1 NM radius of the HUSSH waypoint:

- 99% of aircraft passed within 1 NM of NIITE waypoint.
- 97% of aircraft passed within 1.5 NM of REBAS waypoint. Note: 1.5 NM was used due to the acuteness of the flyby waypoint REBAS.
- 93% of GRTFL transition aircraft passed within 1 NM of GRTFL waypoint.
- 98% of DEDHD transition aircraft passed within 1 NM of DEDHD waypoint.
- 95% of ORRCA transition aircraft passed within 1 NM of ORRCA waypoint.
- 99% of MOGEE transition aircraft passed within 1 NM of MOGEE waypoint.
- 96% of SYRAH/TIPRE transition aircraft passed within 1 NM of the TAMMM waypoint.

The FAA cannot support this sub-recommendation for the following reasons. As explained in OAK Noise Forum Recommendation 1.1, OAK's HUSSH SID is not procedurally separated from SFO's SSTIK SID. The SSTIK SID is used 24 hours a day, but less frequently at night as aircraft operations decrease. This decrease allows the HUSSH SID to be a viable option for night operations. Because these two procedures are not procedurally separated, this means that OAK tower controllers and SFO tower controllers must each manually request a release from Northern California TRACON (NCT) for each of their respective HUSSH / SSTIK departures. This 'only one aircraft at a time' effect is what causes the delays described in the response to OAK Noise Forum Recommendation 1.2. These delays would increase exponentially during the daytime as aircraft volume increases.

1.9 "... the FAA provide modeling or other tools to determine the effects of different REBAS waypoint location options to best mitigate aircraft noise for the Pt. Richmond area and Marin County on the other side of the Bay."

Reference: OAK Noise Forum Recommendations Page 14

Explanation: The FAA cannot support this recommendation. Please refer to OAK Noise Forum Recommendation 1.3 for more information about moving the REBAS waypoint.

WNDSR STAR

- 2.1 **“...the current WNDSR TWO flight track be eliminated and the FAA consider options to replace this RNAV to another location that allows for geographically shorter flight paths and quiet, fuel efficient optimized descents into OAK.”**

Reference: OAK Noise Forum Recommendations Page 17

Explanation: Because this is a general recommendation, and more detail is given in the subsequent recommendations, please refer to those recommendations (OAK Noise Forum Recommendations 2.2, 2.3 and 2.5) for further information.

- 2.2 **North: “...the FAA consider establishing the preferred alternative of OAK to the east. This alternative proposes the FAA consider an RNAV somewhere within a corridor... .. generally encompassing the Mendocino VOR to the Santa Rosa VOR to RAGGS fix then airway V494 towards EMBER and then towards SHARR fix and joining the MADWIN SIX arrival for flights arriving from the north. “**

Reference: OAK Noise Forum Recommendations Page 17

Explanation: The FAA cannot support the OAK Noise Forum’s preferred recommendation for the following reasons:

1. This recommendation would shift aircraft noise from one community to another (see Figure 7 below). The FAA cannot support creating a procedure without consensus from all affected communities. For example, this proposed route would originate just to the south of Lake Berryessa (near the RAGGS waypoint), then proceed in the vicinity of Vacaville and Manteca before turning west towards the OAK airport, shifting the main segments of the WNDSR to the east.

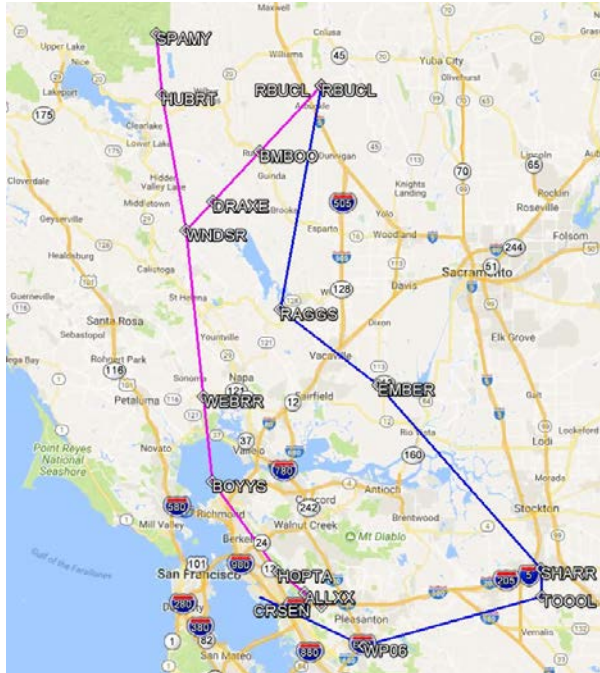


Figure 7 - Current WNSDR STAR (Magenta), Proposed Procedure (Blue)

2. This recommendation would require aircraft on the proposed procedure to be sequenced (vectored) with the OAKES and EMZOH STARS, taking them off their Optimized Profile Descent (OPD). This recommendation would also increase traffic in a congested area where the OAKES and EMZOH STARS are already sequenced together.
3. This recommendation would cross all north/northeast bound Bay Area departures as well as arrival routes from the north, including the OPDs into SFO and SJC. This recommendation also conflicts with the Concord STAR (CCR) into Sacramento and with traffic into and out of the wine country airports, including Napa and Santa Rosa. Unlike the current WNSDR, this recommendation could not be both an OPD and be procedurally separated from the other existing traffic.

2.3 East: “Flight originating from the east could use a corridor towards the SHARR or BANND/TOOOOL waypoints for joining the OAKES TWO arrival... Crossover from the PYE navaid routing to the east towards SHARR or BANND/TOOOOL waypoints can be accomplished further north in Oakland Center’s airspace at their discretion.”

Reference: OAK Noise Forum Recommendations Page 17

Explanation: For the reasons stated in the “Explanation” of OAK Noise Forum Recommendation 2.2, the FAA cannot support this subpart of the preferred recommendation because it ties into what would be the ending area of the proposed procedure.

2.4 “... the FAA undertake airspace and noise analyses to identify appropriate adjustments to avoid population and better achieve flight track efficiency and quiet descent procedures into OAK.”

Reference: OAK Noise Forum Recommendations Page 20

Explanation: The FAA cannot support this recommendation. To the extent this recommendation is asking the FAA to develop procedures consistent with existing land uses and zoning, the FAA shares the following. While safety remains the FAA’s highest priority, the agency attempts to address noise impacts by designing procedures over water and industrial areas when safety and efficiency permit. To the extent your vectoring request seeks to solve a noise issue in one area, doing so may simply shift the noise concern from one location to another. The FAA’s Northern California Optimization of Airspace & Procedures in the Metroplex August 7, 2014 Final Environmental Assessment, Finding of No Significant Impact and Record of Decision (NorCal OAPM Final EA/FONSI/ROD) was the result of the FAA’s thorough noise analysis of the Northern California OAPM’s General Study Area, which included 11 entire counties and portions of 12 other counties. The Northern California OAPM noise analysis included an assessment of aircraft noise associated with Northern California OAPM procedures, vectoring and compatible land use. Although the FAA continues to seek to reduce vectoring by improved Traffic Management Tools and work toward accomplishing vectoring at a higher altitude, aircraft continue to require vectoring consistent with the FAA’s August 7, 2014 noise analysis and completion of the Northern California OAPM.

2.5 “This second alternative proposes the FAA consider an OAK arrival RNAV somewhere within a corridor generally encompassing routing towards the Mendocino VOR then towards Santa Rosa VOR then towards the Concord COR crossing the area near the Concord VOR at 10,000 feet and then routing down the California Interstate 680 highway corridor to the Oakland Runway 30 final approach.”

Reference: OAK Noise Forum Recommendations Page 20

Explanation: The FAA cannot support this recommendation for the following reasons:

1. This recommendation would shift aircraft noise from one community to another. The FAA cannot support creating a procedure without consensus from all affected communities.
2. This recommendation requires the Oakland arrival aircraft to cross multiple arrival routes from the north, including the OPDs into SFO and SJC, and cannot be procedurally separated from these other arrivals. This recommendation also

conflicts with traffic into and out of several airports, including Napa and Santa Rosa, and crosses the northbound Bay Area departure tracks. Additionally, this recommendation conflicts with Travis Air Force Base mission-critical jet traffic.

3. Like the preferred recommendation in OAK Noise Forum Recommendation 2.2 above, that relocates the WINDSR arrival to the east, this recommendation would require the WINDSR, OAKES and EMZOH STARs to be sequenced (vectored) into a single arrival path; taking the aircraft off of the optimized profile descent.
- 2.6 “... the FAA undertake airspace and noise analyses to identify appropriate adjustments to avoid population and better achieve flight track efficiency and quiet descent procedures into OAK.”**

Reference: OAK Noise Forum Recommendations Page 22

Explanation: The FAA cannot support this recommendation for the reasons previously provided in its “Explanation” to OAK Noise Forum’s Recommendation 2.4.

OAKLAND SID

- 3.1 **“...in the short term, the FAA assign headings to aircraft after takeoff that direct aircraft turn left to a heading of 280° until reaching the OAK 4 DME arc, then proceed on the published departure.”**

Reference: OAK Noise Forum Recommendations Page 24

Explanation: The FAA cannot support this recommendation for the following reasons. Because this recommendation is very similar to that of OAK Noise Forum Recommendation 1.1 (restore the SILENT ground track), please refer to its “Explanation” for more information. It should be noted that the OAKLAND NINE departure procedure (currently amended to the OAKLAND THREE) is a legacy procedure that predates OAPM. The geographical relationship between SFO and OAK flight operations precludes the amendment of one procedure without affecting another. One example of this, as illustrated in Figure 8 (below) is the SSTIK SID from SFO and its impact on OAK departures. Similar to the HUSSH and SILENT SIDs, an assignment of a 280° heading for OAK departure aircraft does not ensure the required separation will be maintained with aircraft on the SSTIK SID from SFO. As such, each aircraft assigned the 280° heading would need to be individually coordinated and sequenced into SFO departure traffic, which would impose major delays for both SFO and OAK airports.



**Figure 8 – OAKLAND SID (Orange) and SSTIK SID (Green).
As published, the two procedures are procedurally separated.**

3.2 “...aircraft departing on the OAKLAND NINE not be turned eastbound until leaving 5000 feet (as opposed to 3000 feet in the current ATC directed noise mitigation procedures).”

Reference: OAK Noise Forum Recommendations Page 24

Explanation: The OAKLAND NINE departure procedure (currently amended to the OAKLAND THREE) is a legacy procedure that predates OAPM and is used daily during heavy volume periods. The FAA cannot support this recommendation to amend the legacy FAA Standard Operating Procedures because these aircraft must be sequenced with SFO departures and are flying toward rising terrain to the west. Additionally, not turning aircraft until they reach 5,000’ would impact neighboring communities. The FAA cannot support creating a procedure without consensus from all affected communities.

3.3 “...the FAA evaluate the OAKLAND NINE (daytime departures) and adjust it so that the ground track is further away from BFI/Alameda.”

Reference: OAK Noise Forum Recommendations Page 24

Explanation: The FAA cannot support this recommendation. Please refer to OAK Noise Forum Recommendation 3.1 for more information about shifting OAKLAND departures to the south.

3.4 “...the FAA consider creating an RNAV departure that replicates the newly proposed OAKLAND NINE above”.

Reference: OAK Noise Forum Recommendations Page 24

Explanation: The FAA cannot support this recommendation due to the complexity and congestion of the airspace caused by having two major metropolitan airports in such close proximity to each other. The OAK and SFO departure aircraft that are routed over the same fix must be sequenced into single stream. Due to the proximity of the two airports, the OAPM design team was unable to develop an RNAV departure procedure that would be procedurally separated and provide the mandatory in-trail separation without introducing increased departure delays. Vectoring is the most efficient and safest way to accommodate the volume of traffic in this congested area.

3.5 “...the FAA undertake airspace and noise analyses to identify appropriate adjustments and demonstrate that any proposed changes will result in noise reduction and not adversely impact other areas.”

Reference: OAK Noise Forum Recommendations Page 24

Explanation: The FAA cannot support this recommendation for the reasons previously provided in its “Explanation” to OAK Noise Forum’s Recommendation 2.4.

CNDEL SID

- 4.1 **“Consider adjusting CNDEL THREE departure so that the ground track for this departure is further away from BFI/Alameda. This could be accomplished by directing aircraft departing OAK runway 30 to turn left to a heading of 280° until reaching the OAK 4 DME arc.”**

Reference: OAK Noise Forum Recommendations Page 26

Explanation: The FAA cannot support this recommendation for the following reasons. The geographical relationship between SFO and OAK flight operations precludes the amendment of one procedure without affecting another. One example of this, as illustrated in Figure 9 (below) is the SSTIK SID from SFO and its impact on OAK departures. Similar to the HUSSH and SILENT SIDs, an assignment of a 280° heading for CNDEL departure aircraft does not ensure the required separation will be maintained with aircraft on the SSTIK SID.

Similar to the issues caused by the recommended changes to the HUSSH SID (please refer to OAK Noise Forum Recommendation 1.1 for more information), an initial heading of 280° for OAK departures would provide minimal benefit to the area of BFI/Alameda. As stated previously, the increase in delays caused by a mandatory heading such as this would be severe; a 280° heading would remove lateral separation provided by the procedures and in order to ensure safety would require the individual coordination of CNDEL departures from OAK, which would impose major delays for both SFO and OAK airports.

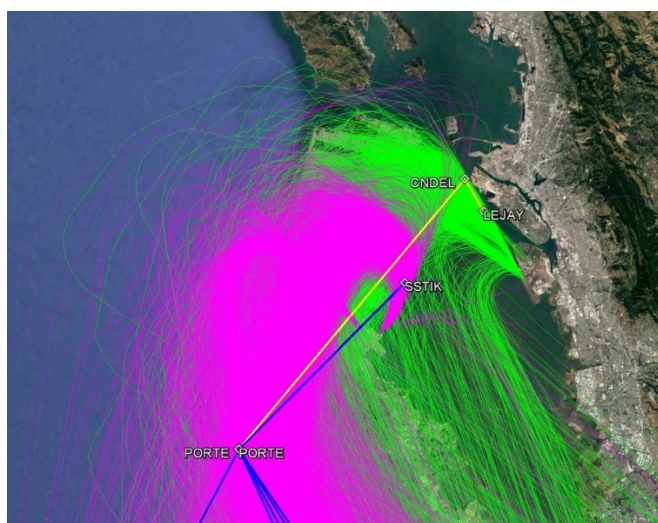


Figure 9 – CNDEL SID (tracks in green, procedure in yellow) and SSTIK SID (tracks in magenta, procedure in blue).

4.2 “...the FAA undertake airspace and noise analyses to identify appropriate adjustments and demonstrate that any proposed changes will result in noise reduction and not adversely impact other areas.”

Reference: OAK Noise Forum Recommendations Page 26

Explanation: The FAA cannot support this recommendation for the reasons previously provided in its “Explanation” to OAK Noise Forum’s Recommendation 2.4.

NIITE SID

- 5.1 **“... the FAA restore the requirements of the night time noise abatement flight procedure as charted under SFO QUIET to SFO NIITE. Restore the heavy charted lines from NIITE to REBAS to indicate this is the charted route to fly unless safety dictates otherwise and adjust the REBAS intersection offshore to keep aircraft over water instead of turning over land.”**

Reference: OAK Noise Forum Recommendations Page 30

Explanation: The FAA has addressed this recommendation. Because the OAK HUSSH SID and the SFO NIITE SID share the same route from HUSSH waypoint (with the exception of the GALOO transition for SFO runway 28 departures), this proposal and the resulting impact will mirror those described for the HUSSH SID (please refer to OAK Noise Forum Recommendation 1.2 for more information). NCT implemented a similar recommendation by Notice on February 21, 2017 and it has since become part of the Standard Operating Procedures (SOP). NCT understands the impact that turning aircraft prior to REBAS have on the East Bay Communities and will continue to monitor this restriction and seek compliance.

Regarding the recommendation to change charted line thickness on the procedure chart, the thinner lines after NIITE indicate en route transitions (GOBBS, GRTFL, DEDHD, ORRCA, MOGEE, TIPRE and SYRAH) and is not indicative of an “optional” route segment. These segments are the final step between the departure and cruise phases of flight. Regardless of the type of procedure segment, pilots must fly the route of flight as cleared by ATC.

- 5.2 **“...the FAA consider regulating and eliminating early turns off of the NIITE prior to REBAS intersection and secure a decreased level of night time noise by creating a memorandum of understanding with ATC to keep aircraft on the route as published to the REBAS intersection for published noise abatement procedures unless safety dictates otherwise.”**

Reference: OAK Noise Forum Recommendations Page 30

Explanation: The FAA has addressed this recommendation. Please refer to OAK Noise Forum Recommendation 5.1 for more information about requiring aircraft to fly the NIITE SID as published until REBAS.

- 5.3 **“...the FAA consider moving the location of REBAS to over the bay to mitigate noise from concentrated aircraft turning eastward over communities in the Point Richmond area.”**

Reference: OAK Noise Forum Recommendations Page 30

Explanation: The FAA cannot support this recommendation. Please refer to OAK Noise Forum Recommendation 1.3 for more information about moving the REBAS waypoint.

- 5.4 **“...the FAA consider adjusting night time hours for noise abatement operations from the current 2200 – 0700 local time Monday through Saturday, 2200 – 0800 local time on Sunday morning to new night time hours of noise abatement procedures of 2100 – 0800 local time daily, seven days a week for relief as flight curfews are not an option.”**

Reference: OAK Noise Forum Recommendations Page 30

Explanation: Please refer to OAK Noise Forum Recommendation 1.7 for more information about adjusting nighttime hours for noise abatement operations.

- 5.5 **“... the FAA provide modeling or other tools to determine the effects of different REBAS waypoint location options to best mitigate aircraft noise for the Pt. Richmond area and Marin County on the other side of the Bay.”**

Reference: OAK Noise Forum Recommendations Page 30

Explanation: The FAA cannot support this recommendation. Please refer to OAK Noise Forum Recommendation 1.3 for more information about moving the REBAS waypoint.

TRUKN SID

- 6.1 “... the FAA consider TRUKN proposals in two sections as detailed above – TRUKN North and TRUKN East. The Forum also requests the FAA consider the WNDSR proposals above as part of overall noise mitigation for TRUKN. As detailed above, moving WNDSR has additional significant advantage in that it frees airspace so that SFO departures can eventually use quieter and more fuel efficient continuous climb procedures.”**

Reference: OAK Noise Forum Recommendations Page 35

Explanation: We have addressed the recommendations for TRUKN and WNDSR as written by the OAK Noise Forum, please see the appropriate OAK Noise Forum Recommendations (2.1 – 2.6 and 6.2 – 6.7).

- 6.2 North – “...the FAA restore the historical traffic concentrations to the topographically lower areas where it existed prior to NextGen and that the communities grew and developed under. To accomplish this, the Forum request that the FAA move the current GRTFL and DEDHD tracks westward of Highway 13 and eastern Oakland to reestablish and better restore historical patterns of SFO departing traffic in this area.”**

Reference: OAK Noise Forum Recommendations Page 35

Explanation: All arrival and departure procedures within the Northern California airspace are interconnected and interdependent – including Santa Rosa (STS) and Napa (APC) – and were designed to improve safety and efficiency within the National Airspace System (NAS). This recommendation’s specific request to move the GRTFL and DEDHD tracks cannot be supported for the following reasons.

The GRTFL and DEDHD departure transitions are procedurally separated from the Oakland WNDSR STAR. In order to keep the departures west of Highway 13, GRTFL would need to be moved more than 5 NM west of its current position and DEDHD would have to be eliminated entirely because there is not enough airspace to accommodate the SFO, SJC, OAK arrivals and these two departure transitions. Alternatively, if the FAA were to support the elimination of the DEDHD transition, moving GRTFL to the west by more than 5 NM would eliminate the procedural separation between the TRUKN departures and OAK WNDSR STAR. Moving GRTFL less than 5 NM miles will not move all aircraft west of Highway 13 as the OAK Noise Forum requested. Additionally, this would add to airport departure delays and aircraft noise would shift due to aircraft from two flight paths (GRTFL and DEDHD) being merged into one (GRTFL). The FAA cannot support creating a procedure without consensus from all affected communities.

- 6.3 East – “...the FAA restore historical traffic concentration to where it existed prior to NextGen and under which communities grew and developed. To accomplish this, the Forum requests the FAA consider adding a track to the area of existing COSMC and HYPEE tracks and adjust to better echo legacy concentrations.”**

Reference: OAK Noise Forum Recommendations Page 37

Explanation: The FAA cannot support this recommendation for the following reasons. The TRUKN Departure Procedure has four transitions to the east. Three of the transitions; ORRCA (Sacramento VOR), MOGEE and TIPRE were utilized with the pre-OAPM departure procedures and the FAA cannot support changing these transitions or how they are utilized. The SYRAH transition was shifted south from its pre-OAPM location at the Linden VOR (LIN) to provide lateral separation between it and the TIPRE eastbound route. Both SYRAH and TIPRE waypoints are the starting points of RNAV Jet Routes, known as Q Routes¹. The OAK Noise Forum’s recommendation would require extensive safety-based communications between NCT and Oakland Air Route Traffic Control Center (ZOA). This would increase the opportunity for miscommunication between controllers and pilots, and would increase delays for both arrival and departure aircraft into Northern California airports.

- 6.4 “... the FAA investigate for both TRUKN North and TRUKN East: Airspace and noise analyses to identify appropriate adjustments to restore historical traffic patterns and conditions.”**

Reference: OAK Noise Forum Recommendations Page 38

Explanation: The FAA cannot support this recommendation. Please refer to OAK Noise Forum Recommendation 2.4, 6.2 and 6.3 for more information.

- 6.5 “... the FAA investigate for both TRUKN North and TRUKN East: Analyze if a procedural decrease in altitude over TRUKN exists and whether higher altitudes can be restored.”**

Reference: OAK Noise Forum Recommendations Page 38

Explanation: The FAA cannot support this recommendation for the following reasons. Departure runway, meteorological conditions, pilot/aircraft operating practices and other factors can affect the overall altitude of an aircraft; however, FAA investigations have determined that no procedural changes have been made that would account for a change in aircraft altitude. For example, preliminary initial flight track analysis of July of 2014 and of 2017 appear to reflect that although the tracks are slightly lower, the changes in altitude

¹ A Q Route is defined as a published RNAV Route generally used above 18,000 feet MSL within the United States.

are likely more of a reflection of the departure runway from SFO than implementation of NextGen procedures (please see Figures 10 and 11 below). Since aircraft departing Runway 01 have less track distance to climb before TRUKN waypoint, they are likely to be at a lower altitude than those from Runway 28. As the landing and departure runway are determined primarily by meteorological conditions (aircraft must generally take-off and land into the wind), ATC does not always have the ability to dynamically select a departure direction. At SFO, Runway 01 is the preferred departure runway as it is compatible with the most common wind direction, keeps departure aircraft over the bay and allows arrival aircraft use of the south bay for their final decent.

Another consideration is altitude restriction. If altitude restrictions were added to the TRUKN departure procedure to increase the climb gradient (increase in altitude over a set distance over the ground), the highest crossing restriction that could be applied at TRUKN waypoint would be at or above 4,530 ft. MSL. Based on preliminary feasibility focusing on flight procedures criteria and overall fly-ability, the average altitude of flight tracks (from runway 01 at SFO) was 5,176 ft. MSL.

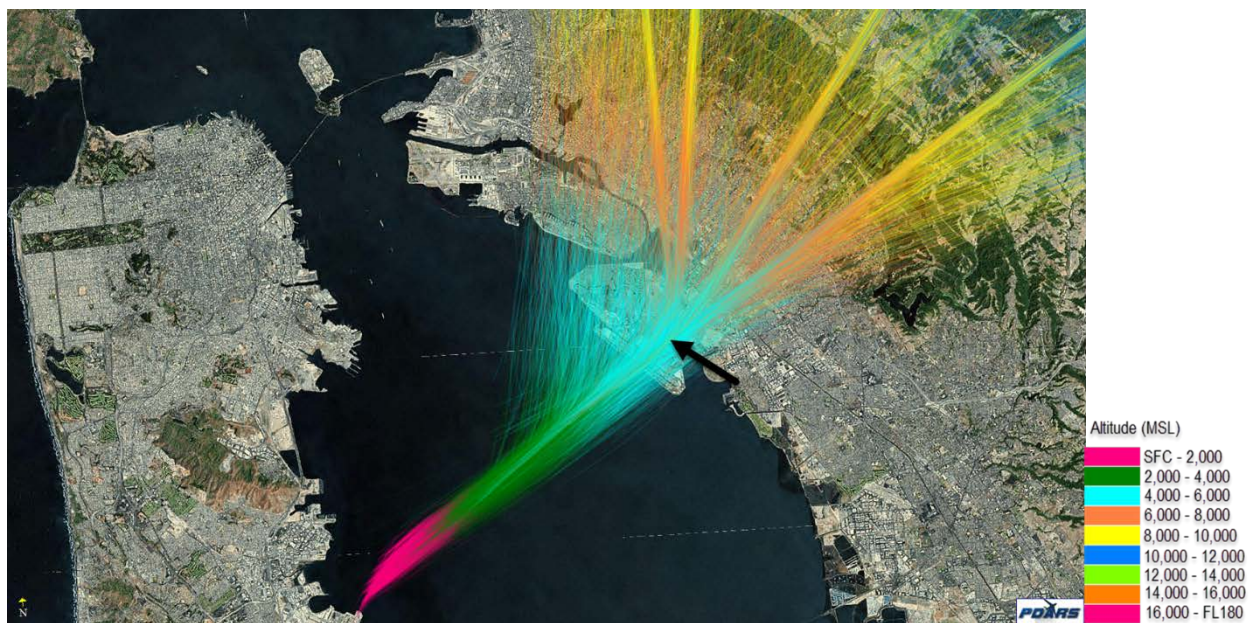


Figure 10 - SFO TRUKN Departures from runway 01.
Average altitude at TRUKN waypoint (indicated by black arrow) – 5,176' MSL.

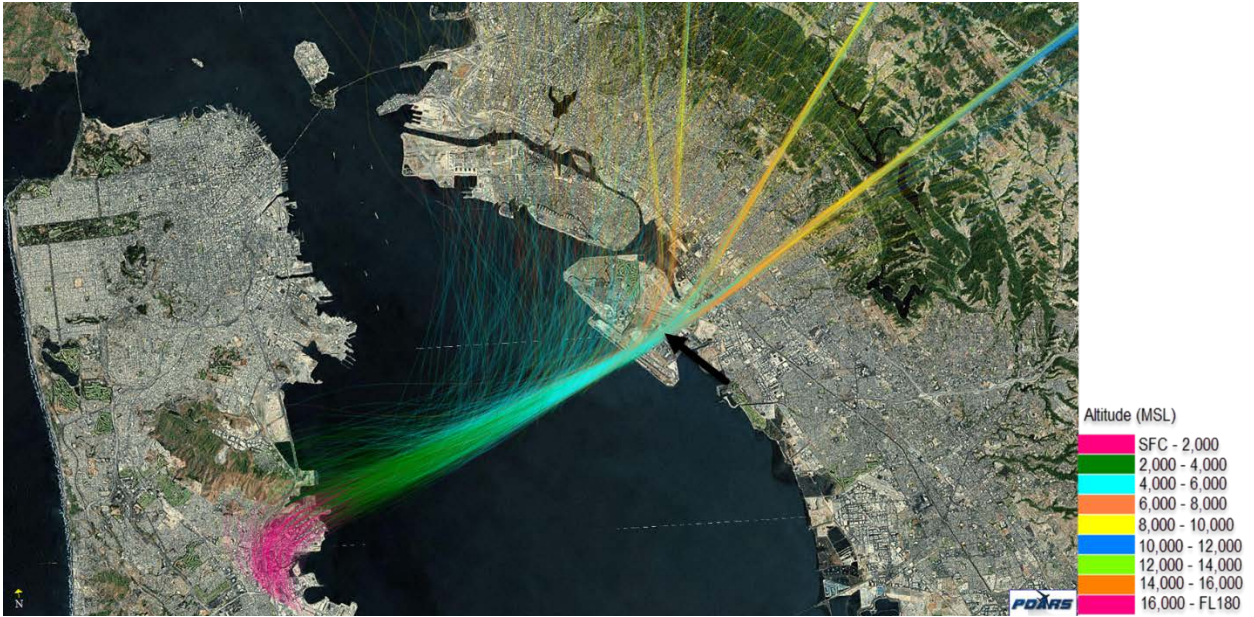


Figure 11 - SFO TRUKN Departures from runway 28. Note the fewer number of aircraft when compared to runway 01 and the higher altitude as they cross TRUKN. Average altitude at TRUKN waypoint (indicated by black arrow) - 6,571' MSL.

- 6.6 “... the FAA investigate for both TRUKN North and TRUKN East: Model how proposed changes will result in noise reduction.”**

Reference: OAK Noise Forum Recommendations Page 38

Explanation: The FAA cannot support this recommendation. Please refer to OAK Noise Forum Recommendation 2.4, 6.2 and 6.3 for more information.

- 6.7 “... the FAA investigate for both TRUKN North and TRUKN East: If FAA automatic navigation procedures become able to assign RNAV tracks automatically to simulate historic dispersed traffic concentrations and legacy noise conditions experienced on the ground along multiple RNAV’s, use the TRUKN procedures to test this capability.”**

Reference: OAK Noise Forum Recommendations Page 38

Explanation: The FAA is constantly looking for enhancements to make the NAS safer and more efficient. Multiple initiatives are underway that range from better understanding the impact of aviation noise on those living around airports to examining how changes in the way aircraft fly can reduce noise.

Further, in order to serve all aircraft types and maximize operational efficiencies, the FAA will retain some conventional procedures in combination with the RNAV Procedures.

Should the recommended technology become available, the FAA will determine the most effective areas for implementation.

Conclusion (3 Process Questions)

7.1 “Specific direction from the FAA for how the process is anticipated to move forward”

Reference: OAK Noise Forum Recommendations Page 39

Explanation: This is an FAA Process Question and is answered in the Introduction (Pages 5-8). The referenced timelines incorporate a number of established federal processes and sub-processes, as well as some background to help the reader’s understanding. Further, the FAA evaluates all specific, technical roundtable recommendations, such as those of the OAK Noise Forum, SFO Roundtable, Select Committee and SJC Ad Hoc Committee, as a whole because of the interdependencies between many of the procedures in the Northern California airspace. Since potential changes need to be evaluated as a whole system, the FAA’s evaluations must be undertaken regionally.

When working on changes to flight paths, and even if not legally required, the FAA engages in community outreach and also carefully considers specific, substantive technical recommendations. Due to the complexity of our national airspace and the safety issues involved in changing flight paths, the agency considers multiple factors to determine if a change is operationally safe and feasible. This multi-step process can take up to two or more years from concept to implementation and require collaboration across multiple organizations.

Finally, the FAA undertakes a rigorous analysis process before it implements or modifies an air traffic procedure. As a federal agency, the FAA is bound by federal regulations, thus the FAA uses the National Environmental Policy Act (NEPA), and the FAA’s Order 1050 for evaluating the effects of a proposed major federal action on the human environment. In regard to designing procedures, safety and operational efficiency are the FAA’s primary considerations.

7.2 “An estimated timeline for the process.”

Reference: OAK Noise Forum Recommendations Page 39

Explanation: Please refer to the FAA’s explanation to 7.1 above.

7.3 “Information on the means the FAA will employ to evaluate approved flight tracks and procedures for noise impacts on the communities over which they will fly.”

Reference: OAK Noise Forum Recommendations Page 39

Explanation: Please refer to the FAA’s explanation to 7.1 above.