



San Francisco International Airport/Community Roundtable
Response to the FAA Initiative Findings, Phase 1

ATTACHMENTS

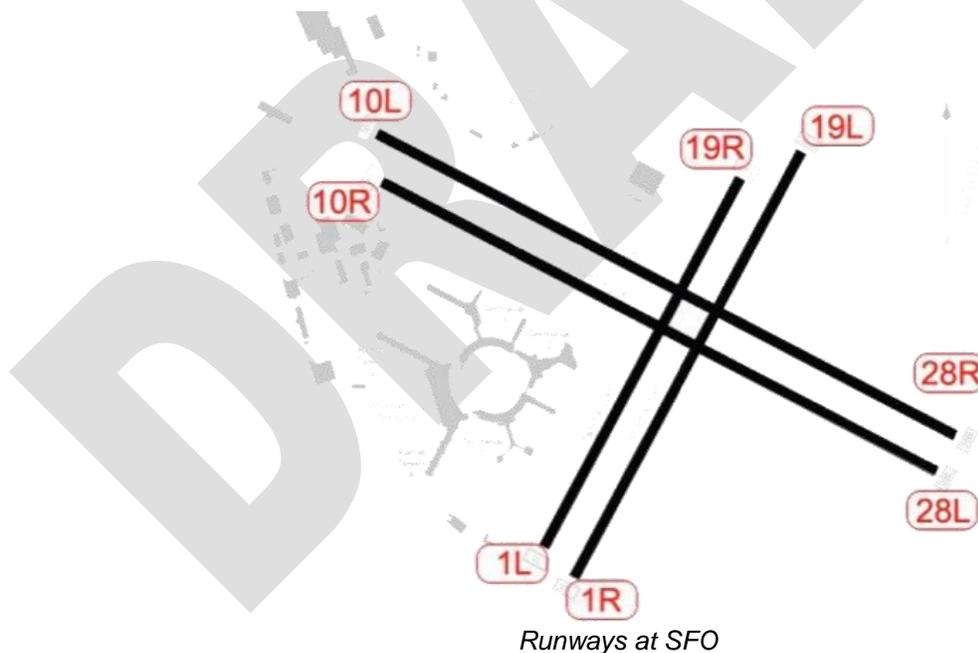
SFO Roundtable letter dated _____.

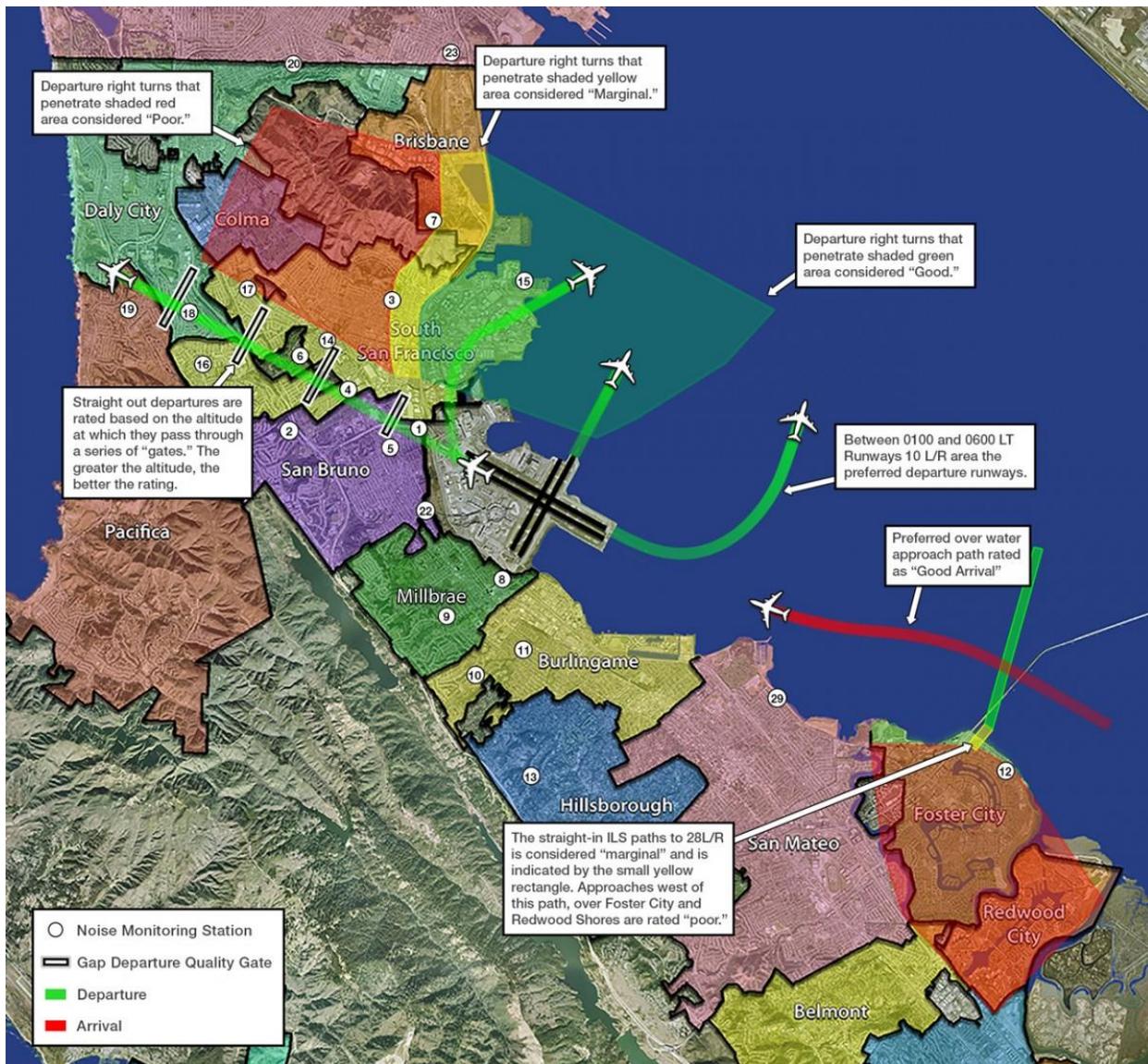
INTRODUCTION

This attachment to the Roundtable's response to the FAA Initiative is to expand on information in the letter to Congresswoman Speier, detailing specific procedure operations as they fly today and any changes the Roundtable is requesting. Each of the "Attachments" has the following sections:

- **Description** – details the procedure(s) as they are flown today
- **Primarily Impacted Cities** – notes the cities that are most directly under the flight path(s) of the procedures being described.
- **Noise Issues** – the primary existing noise issues due to the procedure.
- **Roundtable Requests (Short Term, Long Term)** – details what mitigation efforts the Roundtable is requesting the FAA implement either in the short or long term, depending on the detail of the request.
- **Collaboration** – requests the appropriate agencies to work on each mitigation effort. Initial Requested FAA Research – if applicable, requests the FAA research specific operational items related to the mitigation efforts.

There are two airport diagrams shown here; the first one shows the runways with each runway end labeled, and the second is SFO's Fly Quiet map that shows the general parameters of the Fly Quiet program in a graphic format.





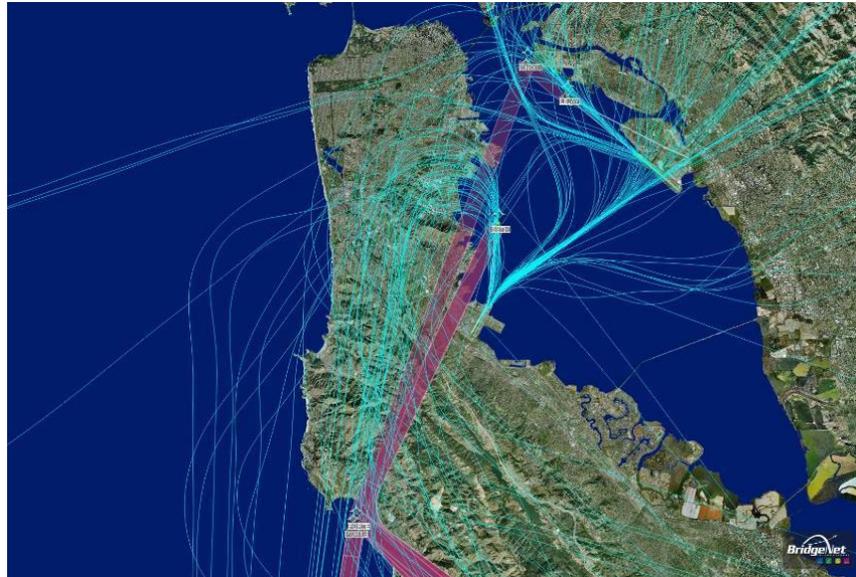
SFO Noise Abatement Office Fly Quiet Program Illustration

In this document, the following abbreviations are used:

- **Mean Sea Level (MSL)** – refers to an aircraft altitude in relation to its location above the average level of the earth’s surface.
- **Above Ground Level (AGL)** – refer to an aircraft altitude in relation to its location relative to the ground below.
- **Nautical Miles (NM)** – the length of a mile used for navigation purposes. All references to miles in this document refer to nautical miles.

PROCEDURE: SSTIK

ADJUSTMENTS: 1.a.ii, 1.b.i, 1.b.ii, 1.b.iii,
2.a.ii(b)



SSTIK

Departure, SFO and CNDEL Departures, OAK

DESCRIPTION: The SSTIK RNAV departure is used by aircraft departing SFO Runways 1L and 1R. After takeoff, the aircraft flies north a short distance over the Bay, then flies over the SSTIK waypoint, located east of the City of Brisbane marina. For southbound destinations, after SSTIK, the aircraft then typically makes a left turn to head south to the PORTE waypoint, located just south of the Half Moon Bay airport.

This procedure replaced the conventional navigation PORTE departure. The new SSTIK waypoint is located approximately 1 nautical mile south of the SEPDY waypoint that is associated with the PORTE procedure; SEPDY is located east of the Baylands Soil Processing facilities. The SSTIK waypoint is closer to downtown Brisbane than SEPDY.

PRIMARILY IMPACTED CITIES: Brisbane, Daly City, Pacifica, San Bruno, San Francisco, South San Francisco as well as Millbrae, Burlingame and other Peninsula cities.

NOISE ISSUES: The San Francisco Bay area is an area rich in diverse topography. The topography of San Bruno Mountain State Park amplifies noise impacts for Brisbane, due to its elevation relative to the City of Brisbane, and from low flying planes that are vectored. Similarly, topography of the coastal range, including Milagra and Sweeny ridges, amplifies noise impacts for Pacifica residents from aircraft flying toward the PORTE waypoint. Planes flying at low altitudes negatively affect all impacted cities.

SFO ROUNDTABLE REQUESTS:

Short Term

Improved utilization of existing flight path and procedures:

1. In the existing procedure, fly the planes on the charted SSTIK departure *as published* so that they fly *over* the SSTIK waypoint. Continuing flight over water beyond SSTIK is encouraged since it will increase altitude prior to turning to fly over sensitive land areas.
2. Avoid issuing any vectors to aircraft for as long as feasible but no earlier than when an aircraft is actually over SSTIK.
3. Avoid vectoring aircraft down the Peninsula direct to waypoints beyond PORTE. Aircraft should fly over the PORTE waypoint on the published procedure.
4. In the existing procedure, use the Bay and ocean for overflight as much as possible.
5. In the existing procedure, utilize existing areas of compatible land use for overflight.

Longer Term

1. SSTIK: Determine if a reduced climb airspeed can be assigned until reaching 3,000 MSL or other higher altitude; a slower airspeed will allow the aircraft to climb to a higher altitude in a shorter distance before overflying noise-sensitive land uses. Determine if the minimum required altitude for ATC to initiate a left turn can be raised.
2. Consider moving SSTIK waypoint north and east as much as feasible to allow maximum altitude gain before turning west to fly over land. Remain over the Pacific Ocean until attaining a high altitude.

COLLABORATION:

1. The SFO RT will provide community input to the FAA to find an appropriate location for moving the SSTIK waypoint east and north of its current location so planes can fly over the Bay for a longer period of time, and thus increase altitude before heading west and flying over residential areas.
2. Request the FAA provide modeling or other tools to determine the effects of different waypoint options.
3. The RT requests the FAA to allow planes to fly the charted procedures and to reduce vectoring and when safety is not an issue as well as to use higher

altitudes when flying over noise-sensitive land uses and the use of non-residential areas where feasible.

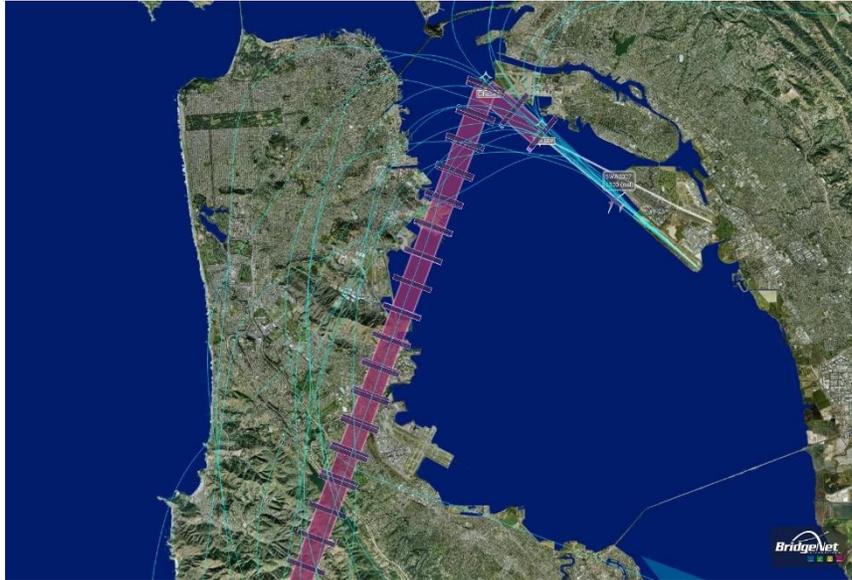
REQUESTED INITIAL FAA RESEARCH:

- 1. FAA is requested to determine any conflicting airspace issues which would not be available for the location of a new SSTIK waypoint.**

DRAFT

PROCEDURE: CNDEL

ADJUSTMENTS: 1.a.ii, 1.b.ii, 2.a.ii(b)



CNDEL Departure Flight Tracks

DESCRIPTION: The CNDEL RNAV departure is typically used by aircraft departing Runway 30 at Oakland International Airport (OAK). After takeoff, the aircraft flies north a short distance over the Bay, then flies over the LEJAY and CNDEL waypoints, west of the USS Hornet and the old naval air station Alameda, respectively. After the CNDEL waypoint, the CNDEL departure procedure directs the aircraft to turn left to the PORTE waypoint located just south of Half Moon Bay airport.

For southbound destinations, aircraft will often be vectored prior to the CNDEL waypoint, at the LEJAY waypoint. *FAA Initiative Phase 1, Appendix B* notes that 46% of CNDEL departures are on the procedure; this assumes 54% of aircraft flying the CNDEL departure are vectored. Many of these flights turn south or southwest over the Bay or towards southern portions of the City of San Francisco and cities in northern San Mateo County. Often, this vectoring places CNDEL and SSTIK flights in a position to compete for the same airspace.

Occasionally aircraft will fly over the Golden Gate Bridge, then turn to the south. Also, aircraft will occasionally be vectored over the SFO VOR navigational aid on the airport, then over Millbrae and Burlingame towards the PORTE waypoint or waypoints downstream on their flight plan.

This procedure replaced the conventional navigation SKYLINE and COAST departures.

PRIMARILY IMPACTED CITIES: Brisbane, Burlingame, Daly City, Millbrae, Pacifica, San Bruno, San Francisco, South San Francisco.

NOISE ISSUES: The San Francisco Bay area is an area rich in diverse topography. This impacts how cities under the departure path experience aircraft noise; there are numerous ridges and peaks leading to valleys that experience aircraft noise differently than if it was all flat land. Between aircraft crossing the peninsula from the Bay to the ocean, San Bruno Mountain State Park amplifies noise impacts for Brisbane, due to its elevation relative to the City of Brisbane. For cities closer to the coast, the topography of the coastal range, including Milagra and Sweeny ridges, amplifies noise impacts for Pacifica residents from aircraft flying toward the PORTE waypoint. Planes flying at low altitudes negatively affect all impacted cities.

SFO ROUNDTABLE REQUESTS

As stated earlier, this procedure should be flown as charted and reduce the number of aircraft vectored. Based on a month of data from July 2015, *FAA Initiative Phase 1, Appendix B* notes that 46% of CNDEL departures are on the procedure; this assumes 54% of aircraft flying the CNDEL departure are vectored.

Short Term

1. In the existing procedure, fly the planes on the charted CNDEL departure as published so that they fly over the CNDEL waypoint and reduce impacts with SSTIK coming from SFO to reduce vectoring of both procedures, utilizing the Bay to gain altitude before flying over populated areas.
2. Use the Bay and Pacific Ocean for overflight as much as possible. From the CNDEL waypoint, direct aircraft to a waypoint in the Pacific Ocean – potentially to the GOBBS waypoint in the ocean.
3. Use the GOBBS waypoint during nighttime hours to reduce overflights of the Peninsula. (HUSSH Departure)
4. In the existing procedure, avoid vectoring aircraft for non-safety reasons prior to the CNDEL waypoint.
5. When feasible, consider delaying the assignment of southbound vectors until the aircraft has reached the ocean to reduce aircraft flying over San Francisco and down the Peninsula. Avoid vectoring aircraft over San Francisco and over the Peninsula direct to PORTE or direct to waypoints beyond PORTE.

Longer Term

1. Determine if the actual flight tracks of aircraft after CNDEL waypoint could be “contained” to a more limited area such as west of the eastern shore of the Bay (perhaps by an additional waypoint) that would decrease potential conflicts with the SSTIK departure airspace to enable the SSTIK departure to be flown as published.

2. The SFO Roundtable requests that the FAA determine if a southbound transition for the CNDEL procedure could effectively use over bodies of water to enable aircraft to gain altitude before flying over noise-sensitive land uses without interfering with a possible expanded SSTIK departure path.

COLLABORATION:

1. The Roundtable is available to provide community input to the FAA with the use of modeling or other tools to determine the effects of other noise friendlier departure paths for flights using the OAK CNDEL departure, especially for CNDEL southbound flights. Such options might include (but are not limited to) flight over the waters of the Bay to the Pacific Ocean or flight over the Bay to SFO and then over the Peninsula (primarily Millbrae and Burlingame) to PORTE or flight down the Bay as far south as feasible, or other options that may become known.

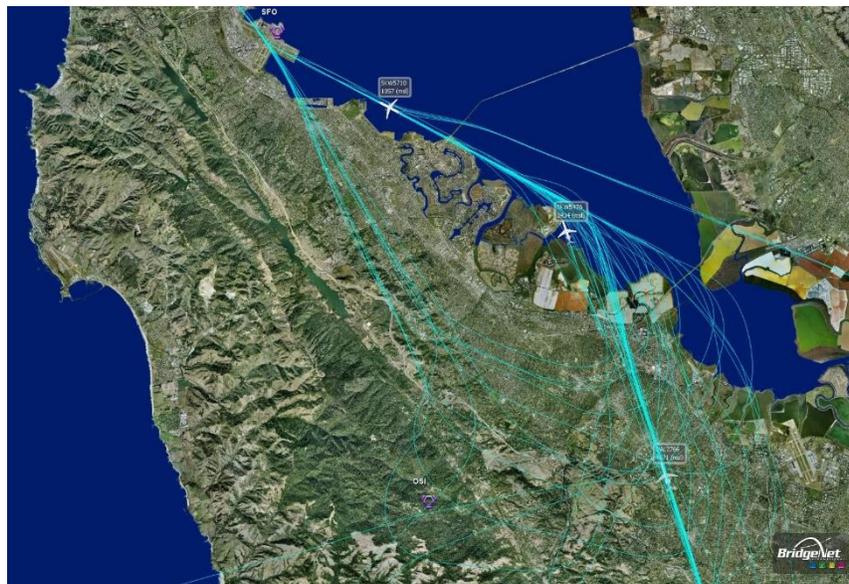
REQUESTED INITIAL FAA RESEARCH:

1. There is no additional research requested.

DRAFT

PROCEDURE: Woodside VORTAC

ADJUSTMENT: 2.a.i.



Woodside and Peninsula Flight Tracks

DESCRIPTION: Aircraft fly in the vicinity of the Woodside VORTAC (a ground-based navigational aid) to arrive at SFO and OAK; this discussion will focus on aircraft arriving at SFO. Aircraft fly over the Woodside VOR area when arriving from the ocean as well as vectored aircraft from the south and north.

OCEANIC ARRIVALS: Aircraft that fly over this area from the ocean are typically flying a course and altitude as assigned by ATC. A minority of these oceanic flights are cleared via the Ocean Tailored Arrival (OTA), an optimized profile descent using idle power and crossing Woodside VOR at approximately 6,000' MSL. Oceanic arrivals not on the Ocean Tailored Arrival (OTA) are assigned to cross Woodside VOR at or above 8,000' MSL when traffic permits. The SFO Noise Abatement Office tracks airline adherence to this procedure on a weekly basis to determine if aircraft crossed the Woodside VOR above 7,700' MSL (because of instrument tolerances an altitude at or above 7,700' is considered to be in compliance with the 8,000' requirement).¹

SERFR AND OTHER ARRIVALS FROM THE SOUTH: Approximately half of the aircraft that fly over this area from the south, typically on the SERFR arrival, are vectored off course to achieve and maintain required separation distance from other aircraft until the aircraft can be sequenced in line for approach and landing at SFO.

BDEGA AND OTHER ARRIVALS FROM THE NORTH: Aircraft arriving from the north on the BDEGA arrival are instructed to proceed on one of two paths – an east downwind which overflies the Bay (“down the Bay”) or a west downwind flying over SFO

¹ <http://www.flysfo.com/community-environment/noise-abatement/reports-and-resources/woodside-vor>

then southeast down the length of the Peninsula before making a “U-turn” or teardrop turn toward SFO. Vectoring is often utilized when needed to achieve and maintain required separation distance from other aircraft until the aircraft can be sequenced in line for approach and landing at SFO.

PRIMARILY IMPACTED CITIES: Woodside, Portola Valley, and the surrounding area as well as numerous Mid-Peninsula Cities.

NOISE ISSUES: As with the previous procedures, it is important to note the topographic variety in the Bay Area. The areas in the south Peninsula overflowed by these procedures are located on large, wooded lots that have low ambient noise levels similar to what can be found in a national park setting. There are also peaks in the area that rise to 2,000’ MSL, including the area around the Woodside VOR that is populated. In the early morning and late night hours, aircraft noise is especially prevalent given the low ambient noise levels.

SFO ROUNDTABLE REQUESTS:

Short Term

1. For daytime BDEGA and other arrivals from the north, the Roundtable requests that the FAA use all available opportunities to assign arrivals from the north to an east downwind “down the Bay.”
2. During the FAA-defined nighttime hours of 10 pm – 7 am, the Roundtable requests every effort should be made to use the Bay for 100% of the arrivals from the north, using the east downwind or the “down the Bay” procedure.

Long Term

1. BDEGA Arrivals from the North: The SFO Roundtable requests reinstatement of BDEGA FINSH transition in order to facilitate increased use of the east downwind (“down the Bay”) to Runway 28R. The BDEGA ONE arrival originally had two transitions from CORKK waypoint – one transition to BRIXX for the west downwind and one transition to FNISH (in the middle of the Bay) for the east downwind. The current BDEGA TWO arrival no longer shows the FNISH transition.
2. BDEGA Arrivals from the North: The SFO Roundtable is available to provide data to the FAA regarding terrain and land use for aircraft arriving on the BDEGA east leg and can work with the FAA to move the east downwind leg of the arrival over compatible land uses.

COLLABORATION:

1. The SFO Roundtable is available to provide data to the FAA regarding land use areas to assist in keeping procedures over compatible land uses as much as feasible during the day. The goal during the nighttime hours is to avoid flight over noise-sensitive land uses as much as feasible, even if it means a few additional track miles.
2. The SFO Roundtable will work with local elected officials from the towns, cities, and County to determine the locations of the most appropriate land uses for vector and other traffic to provide to the FAA.
3. The SFO Roundtable will work with airline representatives to request that during the night time hours, airlines file oceanic flight plans that follow the path of BDEGA arrival for an FAA assigned east downwind for Runway 28R (down the Bay procedure) instead of flying over the peninsula.
4. The SFO Roundtable will work with airline representatives to request that during the night time hours, airlines file routes from the south to a point east of the Bay in order to use a noise-friendlier approach to Runway 28R.

REQUESTED FAA RESEARCH:

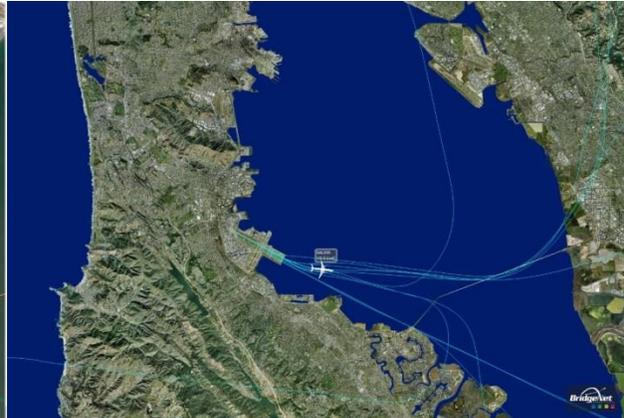
1. Determine if the BDEGA transition to FINSH can be reinstated. If so, determine a timeline for this revised procedure to be included for publication.
2. The SFO Roundtable requests that the FAA research to compare the previous Golden Gate arrival with the current BDEGA arrival to determine what changes have been made in actual flight tracks with regard to location of lateral paths, narrowing of path and concentration of aircraft. The previous Golden Gate arrival directed aircraft to fly a 140° heading after SFO/BRIXX, but the BDEGA directs aircraft to fly a 140° track after BRIXX. While this change seems minor - flying a track instead of a heading - it would result in a more concentrated invariable path, contrasted with using a heading, which, depending on the direction and velocity of wind could create somewhat dispersed paths.
3. The SFO Roundtable requests that the FAA research the usage of the BDEGA West downwind versus the East downwind pre-NextGen and post-NextGen-using the percentage and number of aircraft going using the East and West downwinds and the possible reasons for any changes.

PROCEDURE: Opposite Direction Operations

ADJUSTMENTS: 2.e.i., 2.e.ii., 2.e.iii., 2.g.i., 2.g.ii.



Runway 28 Departure Options



Runway 10L/R Radar Flight Tracks

RUNWAYS 28 DEPARTURES including OPPOSITE DIRECTION OPERATIONS

DESCRIPTION: San Francisco International Airport has two pair of intersecting runways. The two runways oriented north and south (1L/19R and 1R/19L) are shorter than the two runways oriented east and west (28L/10R and 28R/10L). The majority of takeoffs use runways 1L and 1R. However, some aircraft which are heavily loaded (fuel, passengers, cargo) cannot safely takeoff from the shorter runways and must use the longer runways (28L and 28R).

When an aircraft requires the longer runway for takeoff, there are typically three departure choices:

1. Runways 28L or 28R flying straight out the “gap” to the ocean coastline. This is the most impactful departure with noise events to residents reaching 100 dBA.
2. Runways 28L or 28R with an immediate right turn after takeoff towards the Bay. (TRUNKN DP formerly Shoreline, going up the bay).
3. During nighttime hours only, there may be an option to takeoff from Runways 10L or 10R flying over the Bay using a highly regulated procedure called Opposite Direction Operations.

DAYTIME AND NIGHTTIME:

There is a VFR flyway along the Pacific Coast which provides for VFR traffic transit within the Class B airspace; within this flyway, small general aviation traffic typically fly south and west of Highway 101 at or below 2,000'. Departing jet traffic flying straight out from Runway 28 are initially climb restricted to 3,000' to allow for possible VFR traffic in the flyway or other airspace restriction. While the departing jets are not usually kept to 3,000' for a long time, any level off in this high noise departure is significant.

NIGHTTIME:

SFO has had a long-standing nighttime preferential runway use program in place. This program's goal is to utilize the Bay as much as possible for nighttime procedures to keep aircraft over compatible land uses and not fly over populated areas. For SFO, this means use of the Bay for arrivals and departures as much as possible. The preferred nighttime runway use is to depart to the east from Runway 10 L/R over the Bay, and arrive from the west on Runway 28 L/R, which is the typical arrival runway. This type of operation is called Opposite Direction Operations (ODO) when aircraft depart and arrive over the same flight path but at different points in time.

The ability to use the opposite direction operations procedure is limited. Its use is largely dependent on three factors: 1) weather conditions including ceiling, visibility and wind direction and velocity; 2) performance capabilities of the aircraft (primarily whether it can safely takeoff with even a small amount of tailwind or needs a headwind); and 3) the location and distance of any aircraft approaching to land on Runways 28.

ODO regulations have changed over the years since the inception of SFO's nighttime preferential runway use program. It is now more regulated and the arriving and departing aircraft must have more distance between them to use ODO.

PRIMARILY IMPACTED CITIES: Daly City, Pacifica, San Bruno, San Francisco, South San Francisco.

NOISE ISSUES: The San Francisco Bay area is an area rich in diverse topography. This impacts how cities under the departure path experience aircraft noise; there are numerous ridges and peaks leading to valleys that experience aircraft noise differently than if it was all flat land, including San Bruno Mountain close to the airport and Sweeny and Milagra ridges closer to the ocean. At night, some aircraft that require a longer runway that aren't on an ODO departure typically depart "out the gap" on Runway 28 L/R (i.e. straight out), flying west over numerous densely populated cities. These aircraft include those that are flying long distances to Asia and are large, fully loaded wide body aircraft. The ability to utilize Runway 10 L/R more will greatly alleviate thousands of residents being disturbed by Runway 28 gap departures in the middle of the night.

SFO ROUNDTABLE REQUESTS:

Short Term

1. The SFO Roundtable requests that, during the nighttime hours and traffic permitting, TRACON use a longstanding TRACON procedure for aircraft taking off on Runway 10 L/R by vectoring them north up the Bay (using an approximate 330° heading) and then, if westbound, vectoring them to the Pacific Ocean. The following excerpts from presentations and TRACON documents show the existing precedent for using this type of procedure.

SFO Tower Noise Abatement Primer (4/3/13) presented to SFO Roundtable Training:
“330 and 050 heading on mid-shift”

NCT 7110.65D (8/20/15):
Between the hours of 2200 and 0700 local (Sundays to 0800), vector oceanic departures over the Bay to pass over the north end of the Golden Gate Bridge.

SFO Tower Noise Abatement Primer (4/3/13) presented to SFO Roundtable Training:
Mid-shift runway 10 oceanic departures taken over north tower GGB (NCT)

2. The SFO Roundtable requests that the SFO Airport Director coordinate with the FAA to maintain the existing SFO ANAO nighttime preferential runway use in place, including Runway 10 L/R as the preferred nighttime runway for takeoffs.
3. The SFO Roundtable requests that the SFO Airport Director work with the Roundtable to coordinate outreach efforts to educate dispatchers and pilots on the importance of considering the use of a Runway 10 L/R ODO departure to the impacted communities.

Long Term

1. Small, general aviation aircraft utilize a common route called the “Bay Tour” that is VFR flyway that flies in the vicinity of SFO; it is not a designated part of the Class B airspace. However, it should be determined if this VFR flyway existence results in Runway 28 straight-out departures being assigned a 3,000’ altitude restriction. If so, determine if a modification of this VFR flyway is warranted in the current Class B Airspace Modification process to allow unrestricted climbs for SFO Runway 28 jet traffic. If the altitude restriction is due to other factors, determine if the other factors can be modified to allow unrestricted climb.
2. Create a procedure that includes the ability of aircraft to depart Runway 10 L/R on a heading that isn’t in the direct path of aircraft arriving on Runway 28, such as making an immediate left turn after takeoff or flying to the east of the Runway 28 arrival path to provide lateral separation; for vertical separation, use altitude restrictions for the departing aircraft.

COLLABORATION:

1. The SFO Roundtable will provide information to the FAA to assist in a review of options for aircraft to use Runway 10 L/R that does not use the same flight path as a Runway 28 L/R arrival.
2. The SFO Roundtable urges the consistent use of effective noise abatement procedures such as the long-standing TRACON nighttime noise abatement

procedure for aircraft taking off from Runway 10, to fly an approximate 330° heading up the Bay and thence out the Golden Gate.

REQUESTED FAA RESEARCH:

- 2. There is no additional research requested.**

DRAFT

PROCEDURE: NIITE

ADJUSTMENTS: 1.f.iii, 2.a.ii., 2.a.ii.(c)., 2.f.i., 2.f.vi.



NIITE Procedure

DESCRIPTION: The NIITE departure is designed to be used only during nighttime hours as a noise abatement procedure when the volume is light and typically used by aircraft departing Runway 01 L/R at SFO during nighttime hours as a noise abatement procedure; aircraft will use the NIITE departure off Runway 28 L/R, but it is more commonly used off Runway 01. After takeoff, the aircraft flies northeast to a waypoint approximately six miles northeast of SFO called MDBAY. At this point aircraft turn towards the north to the NIITE waypoint, located approximately 12 miles north of MDBAY just north of Treasure Island, then northbound or eastbound aircraft turn to the north to the REBAS waypoint over Richmond, and westbound aircraft fly west to the GOBBS waypoint located approximately 11 miles west of the Golden Gate Bridge in the Pacific Ocean.

This procedure replaced the conventional navigation QUIET departure.

PRIMARILY IMPACTED CITIES: Brisbane, Daly City, Pacifica, San Francisco, South San Francisco and other mid-Peninsula communities.

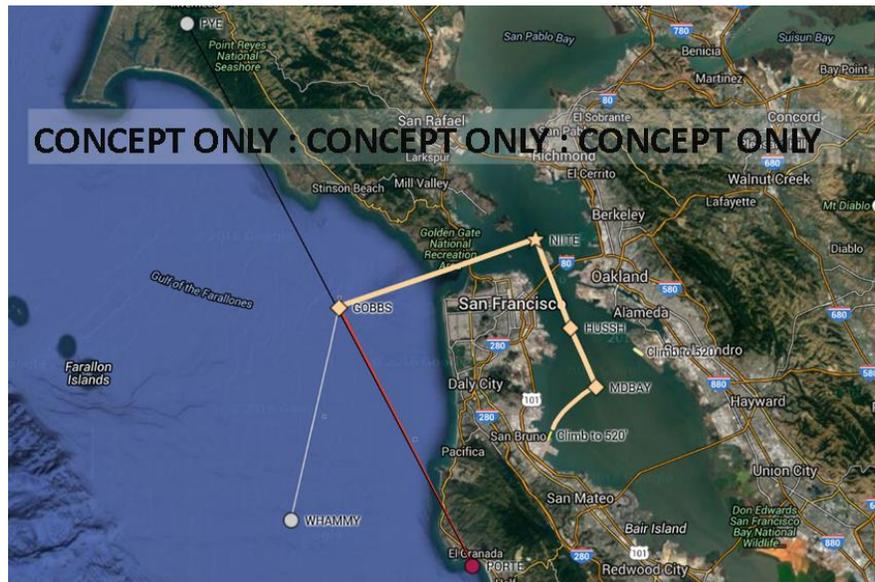
NOISE ISSUES: Aircraft overflying compatible land uses reduce the number of citizens experiencing aircraft overflights during nighttime hours. Aircraft that can use the NIITE procedure instead of flying over the peninsula can reduce noise impacts for thousands of residents each night. Aircraft flying over the peninsula are overflying areas rich in diverse topography. This impacts how cities under the departure path experience aircraft noise; there are numerous ridges and peaks leading to valleys that experience aircraft noise differently than if it was all flat land.

SFO ROUNDTABLE REQUESTS

Short Term

1. Southbound Transition: While undergoing the formal process of amending the NIITE departure to add a transition for southbound aircraft, the SFO Roundtable requests that NORCAL TRACON work with the SFO RT to determine if an interim informal procedure based on TRACON vectors might be feasible to approximate the NIITE departure which would be heading up the Bay to NIITE, then west to GOBBS, then south-south-east to PORTE remaining offshore. For aircraft flying to southern destinations during nighttime hours, the SFO Roundtable requests TRACON use the existing transition from the NIITE waypoint to GOBBS waypoint, located in the ocean, past the Golden Gate Bridge. Aircraft would fly this transition from the NIITE waypoint instead of flying over the Peninsula on a PORTE or SSTIK procedure during nighttime hours.
3. Keep aircraft on the NIITE procedure as much as possible to reduce vectoring; aircraft remaining on the NIITE procedure until the REBAS waypoint (for eastbound flights not affecting San Francisco or San Mateo Counties) located near the city of Richmond will keep aircraft over compatible land uses.
4. Runway 10: While undergoing the necessary research and procedure development to enable Runway 10 L/R departures to use the published NIITE departure, the SFO Roundtable requests that NORCAL TRACON use its longstanding noise abatement procedure to vector Runway 10 L/R departing aircraft up the Bay (approximate heading of 330°), then vector as needed for route of flight such as from NIITE to GOBBS (if the destination is to the west or south), in accordance with guidance for westbound aircraft in NCT 7110.65: *Between the hours of 10:00 pm 7:00 am local (Sundays to 8:00 am), vector oceanic departures over the Bay to pass over the north end of the Golden Gate Bridge.*
5. While not increasing the actual number of aircraft using Runway 01 L/R, the Roundtable urges the FAA to continue to use the Runway 01 L/R 050° heading option for southbound flights at night instead of the SSTIK procedure for southbound departures.

Long Term



BEIGE LINE (approximate): Depicts current SFO NIITE Departure. **RED LINE** (approximate): Depicts one concept option for the NIITE Departure South Transition. **LIGHT GRAY LINE** (approximate): Depicts one concept option for the NIITE Departure South Transition

1. NIITE Southbound Transition: The SFO Roundtable is in agreement with FAA *Initiative* Adjustment 2.f.i and formally requests that the FAA add a transition to the NIITE departure for southbound aircraft.

Without presuming to technically design such a south transition, it would seem that this highly desirable southbound destination transition *might* be comprised of a single, simple “add-on” leg, using the existing NIITE departure to the GOBBS waypoint, and thence via already largely existing waypoints and flight paths mirroring much of the PORTE departure to PORTE intersection. In addition, the routing of the OFFSHORE departure may present an additional option. The SFO Roundtable understands that the design of professional flight procedures encompasses far more than a line drawn on a map, and understands that airspace use and airspace restrictions are significant challenges in this process.

The possible southbound transition for the NIITE departure depicted above contains just two concepts to consider. The “add-on” paths depicted seem desirable not only because they keep aircraft largely over the Pacific Ocean, but also because a significant portion of the “add-on” paths are routinely used in the PORTE and OFFSHORE departures. Many other paths for this southbound transition could be designed that would also keep aircraft over the ocean.

Once implemented, the concept for the NIITE southbound transition would be that during night time hours, the airline dispatcher would file for the NIITE departure with the new southbound transition. At the time of takeoff, if conditions and SFO Tower/TRACON workloads permit, an aircraft departing Runway 01 L/R will be offered the option of the 050° heading down the Bay departure instead of

the filed NIITE/south transition.

2. NIITE Departure with Runway 10 takeoffs authorized: The SFO Roundtable requests that the NIITE departure and all transitions be amended to include authorization for its safe use by aircraft taking off from Runway 10 L/R.

COLLABORATION:

NIITE Southbound Transition & NIITE Departure with Runway 10 takeoffs authorized:

1. The SFO Roundtable will provide input regarding the new southbound transition and will elicit community input and response to the design of the new NIITE southbound transition and Runway 10 L/R NIITE authorization.

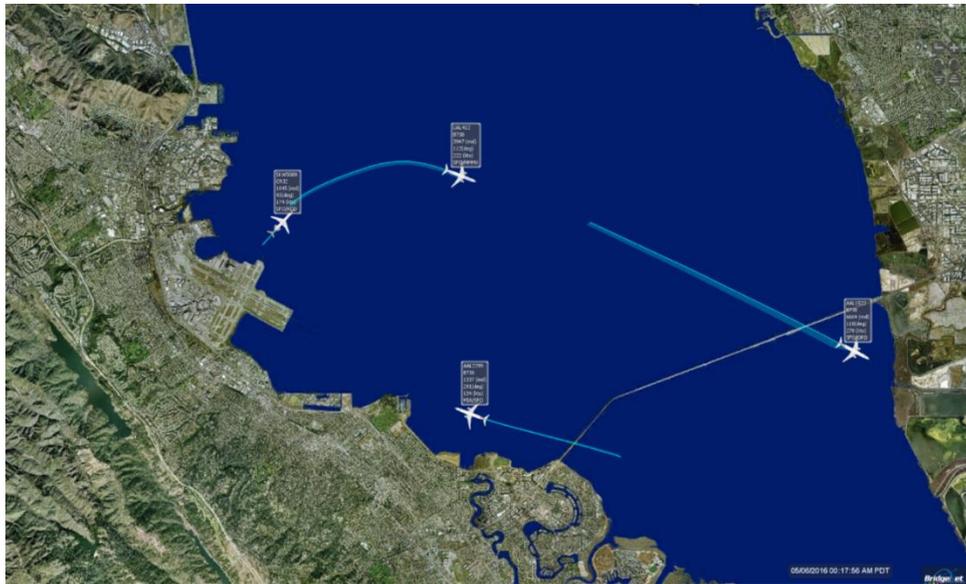
REQUESTED INITIAL FAA RESEARCH:

1. **There is no additional research requested.**

DRAFT

PROCEDURE: 050° Heading Off Runway 01

ADJUSTMENTS: 2.e.ii., 2.g.ii.



Runway 01 L/R Flight Tracks

DESCRIPTION:

Aircraft departing during nighttime hours on Runways 1L/1R for southern destinations typically fly the SSTIK departure; the NIITE departure, the published noise abatement procedure, is typically only used for aircraft with northern or eastern destinations. During nighttime hours only and when traffic permits, ATC can assign a Runway 1L/1R departure to fly an initial heading of 050° with further right turns down the Bay until reaching a higher altitude and then direct them on course to their destination. This 050° initial heading can also be used to allow eastbound aircraft to gain additional altitude before turning them onto an easterly heading which reduces noise impact for East Bay residents. The 050° initial heading was originally created through collaboration between the Roundtable and TRACON, to help reduce noise impacts at night.

Typically, aircraft departing from OAK will also use the Bay for aircraft to climb before flying over land.

IMPACTED CITIES: Brisbane, Daly City, Pacifica, San Bruno, San Francisco, South San Francisco and other north Peninsula cities.

NOISE ISSUES: Aircraft using compatible land uses reduce the number of citizens experiencing aircraft overflights during nighttime hours. Aircraft that can use the 050° heading procedure instead of flying over the Peninsula and San Francisco can reduce noise impacts for thousands of residents each night. Aircraft flying over the Peninsula are overflying areas rich in diverse topography. This impacts how cities under the

departure path experience aircraft noise; there are numerous ridges and peaks leading to valleys that experience aircraft noise.

SFO ROUNDTABLE REQUESTS:

Short Term

1. Use the 050° heading at night to the maximum extent feasible for aircraft departures to southern destinations instead of SSTIK or PORTE departure procedures that fly over the Peninsula and San Francisco. The request for maximum use of the 050° heading departure procedure is not a request to increase the number of flights using Runways 1L/1R since back blast from runways 1L/1R departures have a noise impact on the cities southwest of the departure end of Runways 1L/1R.
2. The Roundtable also requests the use of a comparable heading down the Bay southbound flights taking off from OAK Runway 30.

Long Term

Continue flying the 050 heading when able during nighttime hours.

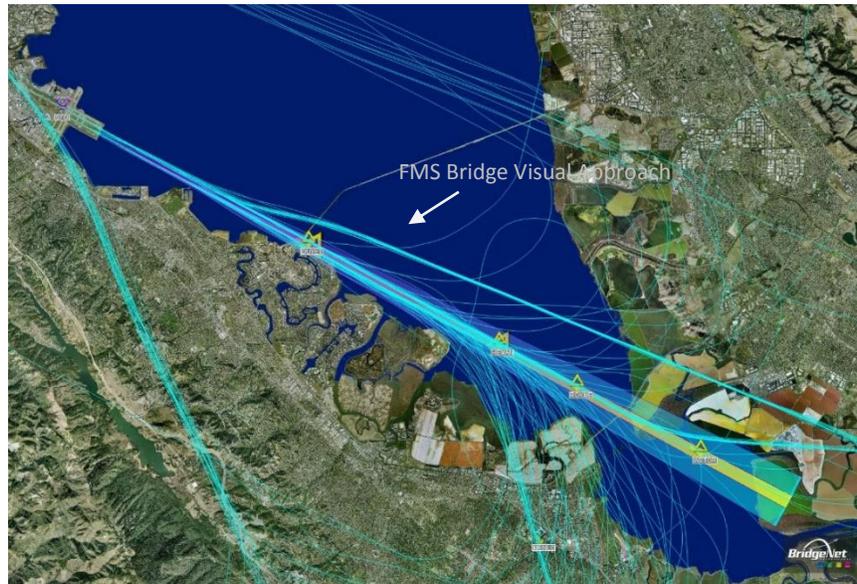
COLLABORATION:

REQUESTED FAA RESEARCH:

2. **There is no additional research requested.**

PROCEDURE: Visual Arrivals, Foster City Arrivals

ADJUSTMENTS: 1.b.iii., 1.b.iv., 1.b.v.



DESCRIPTION: Runways 28L and 28R are the primary runways for landing at SFO when the airport is using the West Plan which is 85% of the time. Runways 28L and 28R are each served by a precision electronic Instrument Landing System (ILS). The lateral path for the Runway 28L ILS goes over the city of Foster City while the lateral path for Runway 28R ILS is slightly offshore. An ILS approach is used when the SFO weather is IMC (Instrument Meteorological Conditions) and pilots cannot visually see the airport and must rely on their instruments to be guided to the runway.

During VMC (Visual Meteorological Conditions), aircraft flying visually to 28L will generally replicate the Runway 28L ILS lateral path which provides separation from the Runway 28R lateral path. Aircraft flying visually to Runway 28R can fly offset visual approaches such as the FMS Bridge Visual Runway 28R or the RNAV (RNP) Runway 28R. These Runway 28R offset visual courses fly closer to the center of the Bay and do not intercept the Runway 28R ILS lateral path until just past the San Mateo Bridge. There is no offset approach for Runway 28L.

PRIMARILY IMPACTED CITIES: Foster City and other bayside cities.

NOISE ISSUES: Aircraft in a landing configuration is also known as a 'dirty' configuration, which means that the landing gear and flaps are deployed for the impending landing. Each of these pieces of the aircraft that extrude - the flaps, speed brakes, landing gear and the engines all contribute to noise generated by an aircraft on arrival. When air travels over these extended surfaces, it is disrupted by the different surfaces coming into contact with the air. The more surfaces come in contact with the air, the louder the aircraft will be to those on the ground. At this point, aircraft are

approximately seven miles from the airport at altitudes below 2,000' mean sea level. This can be very disruptive to sleep as well as to activities of daily life.

SFO ROUNDTABLE REQUESTS:

Short Term:

1. Dual Visual Approaches: Whenever there are arrivals to both Runway 28L and 28R, and VMC conditions allow, aircraft for Runway 28R should be assigned to fly the FMS Bridge Visual Runway 28R or RNAV (RNP) Runway 28R (as capable), Quiet Bridge Visual or other noise friendlier approach to land on Runway 28R.
2. Single Stream Visual Approaches: Regardless of the time of day, and when conditions and traffic allow, whenever there is a single stream operation to only one runway, aircraft should arrive only on Runway 28R and should be assigned to fly the FMS Bridge Visual 28R or RNAV (RNP) Rwy 28R (as capable), Quiet Bridge Visual or other "noise friendlier" approach to land on Runway 28R.
3. During the nighttime hours ATC should make every effort to coordinate traffic arrivals to create a single stream of traffic to land only on Runway 28R. Depending on weather conditions, aircraft would be expected to fly the FMS Bridge Visual 28R, the RNAV (RNP) Runway 28R, (or if conditions require) the ILS 28R or other approach to Runway 28R which minimizes noise impact to Foster City and other Bayside communities.
4. With air traffic control anticipating these arrivals to the right runway, efforts can be made to reduce any time spent waiting for aircraft to depart Runway 28L and coordinate these arrivals and departures.

Long Term

1. Research the feasibility of creating dual offset RNAV, RNAV (RNP) or other type of approach to Runway 28L and to Runway 28R which would create two offset paths closer to the middle of the Bay with both Runway 28L path and 28R path remaining well clear of Foster City and other bayside communities until past the San Mateo Bridge when aircraft would then line up with each runway for landing.



TEAL LINE: existing 28L ILS. **PINK LINE:** existing 28R ILS. **GRAY LINE:** existing RNAV (RNP) Y RWY 28R. **ORANGE LINE:** existing FMS Bridge Visual Approach 28R. **GREEN LINE:** Concept for a possible 28L offset RNAV approach. **BLUE LINE:** Concept for a possible 28R offset RNAV approach. ALL POINTS AND LINES APPROXIMATE.

COLLABORATION:

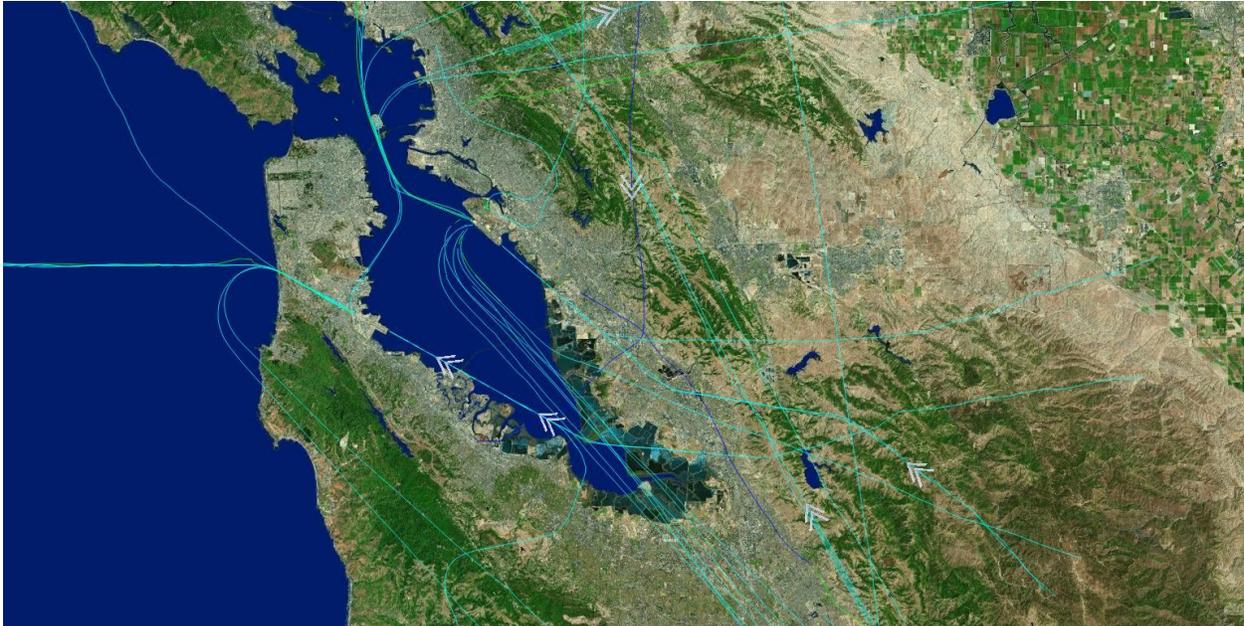
1. The SFO Roundtable will provide materials to NCT management to illustrate the importance of the use of Runway 28R instead of Runway 28L during periods of single stream operations and the critical nature of nighttime operations which might require managing arrival traffic to create a single stream of traffic to 28R.
2. The SFO Roundtable will provide information and community input to the FAA regarding the process of creating, if feasible, of dual satellite-based Runway 28L and 28R offset approaches closer to the middle of the Bay.

REQUESTED FAA RESEARCH:

1. There is no additional research requested.

PROCEDURE: NIGHTTIME OFFLOADS/ROUTES

ADJUSTMENTS: 3.d.i.



Nighttime Flight Tracks

DESCRIPTION: Flights that take-off and land at SFO and OAK during the nighttime hours significantly impact hundreds of thousands of residents in San Francisco and San Mateo counties. Widespread resident reports indicate that their health is being seriously compromised due to aircraft noise causing continual sleep deprivation. The Roundtable believes that because of the serious impact on residents' health, the FAA should take extraordinary steps to decrease aircraft noise at night – even if it additional miles flown by aircraft.

Many of the nighttime hours are also a time of increased flexibility for ATC due to significantly fewer flight operations and a curfew at San Jose Airport beginning at 11:30 pm. These factors allow ATC to increase the use of already existing noise abatement nighttime procedures as well as to consider the possibility of adopting additional noise abatement nighttime procedures.

Nighttime hours are generally stated to be 10:00 pm-7:00 am. (CNEL, SFO Noise Abatement website, TRACON SOP), although the SFO Noise Abatement Office also highlights the hours of 1:00 am-6:00 am for desired voluntary use of the preferential runway use.

The ability of ATC to utilize alternative nighttime procedures is not tied to the hands on a clock, but rather relies on the decreased number of flights being operated during nighttime hours. Thus, if weather delays cause originally scheduled evening flights to have their takeoff delayed into the nighttime hours, some nighttime quieter procedures cannot be used until later in the nighttime when flight operations actually decrease.

Several noise abatement departures have been published (NIITE & HUSSH departures for SFO and OAK flights to the north, west and east), SFO Runway 28 take-offs with an immediate right turn (TRUKN – formerly Shoreline).

In addition, NORCAL TRACON makes use of additional important nighttime hours' procedures (SFO Runway 1L/R southbound with an initial 050° heading; OAK Runway 30 southbound with an initial ~130° heading; SFO Runway 10L/R Opposite Direction Operations take-off procedure; Runway 28R single stream approaches only; noise abatement approaches to Runway 28R (FMS Bridge Visual, Quiet Bridge Visual, RNAV (RNP) 28R.)

However, there are still flight paths which cause significant noise impact to families in the middle of the night: SSTIK & CNDEL for southbound flights, BDEGA and other arrivals from the north using the **west** downwind, Oceanic arrivals over Woodside to MENLO, 28L approaches over Foster City, SERFR and other arrivals from the south to MENLO.

PRIMARILY IMPACTED CITIES: San Francisco and the cities in San Mateo County.

NOISE ISSUES: Aircraft fly the Oceanic arrivals during periods of low traffic volumes, typically at night, during late night and early morning hours. The areas in the south peninsula overflown by these procedures are located on large, wooded lots that have low ambient noise levels similar to what can be found in a national park setting. There are also peaks in the area that rise to 2,000' MSL, including the area around the Woodside VOR that is populated. In the early morning and late night hours, aircraft noise is especially prevalent given the low ambient noise levels that can be extremely disruptive to sleep. Although the total number of nighttime flights may not seem high, the impact of these overflights throughout the night is devastating to the residents. As an example, on July 19, 2016, between the hours of 4:33 am and 6:53 am, there were seven flights from the Hawaiian Islands that flew over this area as close as 10 minutes apart as shown below:

- UAL 1557 landed at 4:26am
- UAL 396 landed at 4:33am
- UAL 1746 landed at 4:43am
- UAL 1724 landed at 5:03am
- VIR 48 landed at 5:40am
- UAL 1580 landed at 6:05am
- UAL 1575 landed at 6:53am

SFO ROUNDTABLE REQUESTS

Short Term:

During the **nighttime hours ONLY**, the SFO RT requests:

1. **NIITE/HUSSH transition for southbound flights:** While awaiting the publication of this southbound transition, it is requested that aircraft be vectored in according with long-standing NCT procedures (SFO 330° heading up the Bay) and (SFO and OAK) out to the ocean and southbound over the Pacific Ocean.) The SFO RT also supports the NCT use of the 050° heading* for SFO southbound departures.
2. **28L approaches over Foster City and north Peninsula:** The SFO RT requests that, all nighttime approaches be managed into a “single stream” of airplanes, that (wind/weather permitting) this single stream of planes only uses noise abatement approaches such as the Runway 28R FMS Bridge Visual, the Runway 28R Quiet Bridge, or the RNAV (RNP) 28R and that this single stream of planes lands only on Runway 28R. If conditions require an ILS approach, it is requested that only Runway 28R be used. Continuing to land on 28R, rather than sidestepping to 28L, can reduce noise to residents from approach thrust and reverse thrust after landing.
3. **Arrivals from the North:** The SFO Roundtable requests that BDEGA and other arrivals from the north be assigned only to the BDEGA East downwind (or similar) for a “noise-friendlier” approach to only 28R.
4. **ALL approaches:** The SFO RT requests that, when feasible, during nighttime hours and VMC conditions -- *if any flights fly over sensitive areas* -- every effort be made which would allow aircraft to **remain higher than typical** and are vectored so as to approach single stream using noise-friendlier approaches to land on Runway 28R.
 - If an arrival ***must*** be made over Woodside (Oceanic) or the Peninsula (BDEGA) or from the south (SERFR), every effort should be made to keep aircraft higher than typical. This excess altitude could be expeditiously dissipated by giving the aircraft a slightly longer path over the Bay before intercepting an appropriate noise-friendly visual approach to 28R. The amount of altitude increase over the sensitive land use areas will be related to the available additional distance flown to lose that altitude through whatever lateral path is flown. If the pilot can anticipate the plan, he/she would be prepared for an expeditious descent over the Bay prior to intercepting the typical FMS Bridge Visual or other noise friendlier approach.

Longer Term:

1. **NIITE transition for southbound aircraft:** *This is FAA Initiative Feasible item 2.f.i.*: The SFO Roundtable supports an immediate start to designing the southbound transition for SFO and OAK flights on the NIITE departure. This NIITE departure/southbound transition procedure will replace the SSTIK and CNDEL departures during the nighttime hours.
2. **BDEGA Arrivals from the North:** The SFO Roundtable requests reinstatement of the FINSH transition to the BDEGA Arrival in order to facilitate increased use of the BDEGA East downwind (“down the Bay”) to Runway 28R or the establishment of a similar east downwind transition if there are technical concerns with the original design.
3. **Oceanic:** The SFO RT will work with airline representatives to request that all nighttime arrivals from the north file for and fly an approach which utilizes the Bay (such as the BDEGA East downwind) and substantially avoids flight over non-compatible land uses.
4. **Nighttime Arrivals:** The SFO Roundtable will work with airline representatives to encourage them to file for SFO arrivals that avoid flight over sensitive areas. If inbound aircraft choose to file for BDEGA, it is requested that only the BDEGA East downwind be assigned to them.

COLLABORATION:

1. The SFO Roundtable will provide any required community data as well as community input to the FAA to support all efforts to improve noise impacts during the important night time hours.

REQUESTED INITIAL FAA RESEARCH:

1. **There is no additional research requested.**