APPENDICES

APPENDIX A

SFO Runway Usage

Daytime Preferred Runway

The preferred runway selection for day time usage at SFO is primarily based upon wind direction, and may be found in the SFO Standard Operating Procedures (SOP) (FAA Order SFO 7220.2J, CHG 1). Table A1 reproduces this information. The arrival and departures runway for each plan is listed in a descending order of preference:

WEST PLAN		SOUTHEAST PLAN	
ARRIVALS	DEPARTURES	ARRIVALS	DEPARTURES
RWY 28	RWY 01	RWY 19	RWY 10
RWY 28	RWY 28	RWY 19	RWY 19
RWY 01	RWY 01	RWY 10	RWY 10

Table A1: Day time SFO preferred runway usage (7am – 12pm)
FAA Order SFO 7220.2J, CHG 1, Table 4-1-1

The preferred runway configuration for each plan uses different runways in order to maximize the arrival and departure rate. When a single runway is utilized for both arrivals and departures, ground delays increase by approximately 40%[1]. The preferred arrival and departures runways for both plans allow for arrival and departures to land and depart immediately over water.
Figure A.2 illustrates plan based upon monthly wind data.

Key: Preferred departure direction Preferred arrival direction

Figure A.1 Preferred arrival and departure directions for both west and southeast plans.

[1] According to the Operational Network (OPSNET) https://aspm.faa.gov/opsnet/sys/main.asp In July 2015 there were 1842 system impact delays, which were primarily caused by weather or volume issues. In July 2014, when RWY 01 was closed and arrival and departures were both using RWY 28, there were 724 system impact delays attributed caused by runway issues. This represents a 40% increase over the July 2015 baseline.

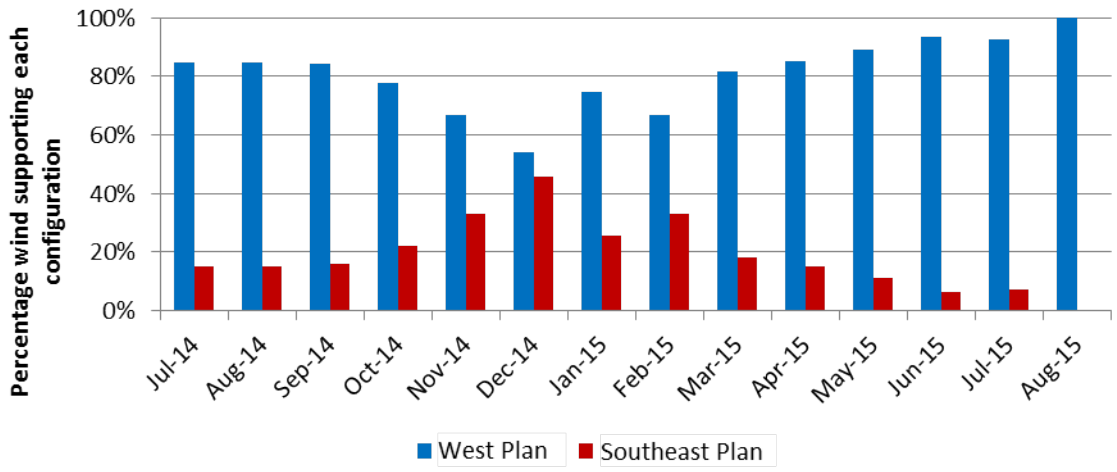


Figure A.2: Arrival and departure runway usage plan based upon wind direction at SFO

Figures A.3 and A.4 below illustrate that the runway usage correlates with the wind direction.

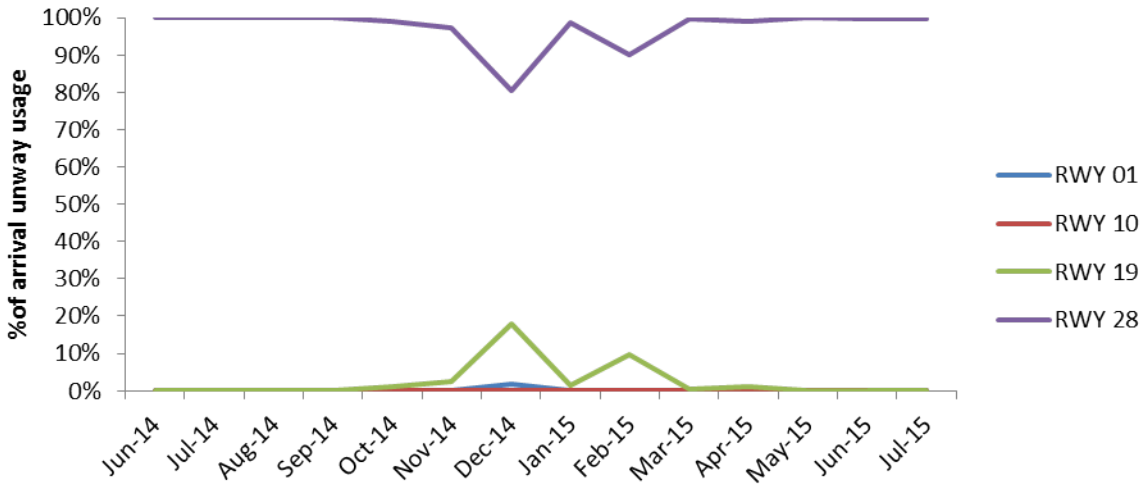


Figure A.3: Arrival runway usage

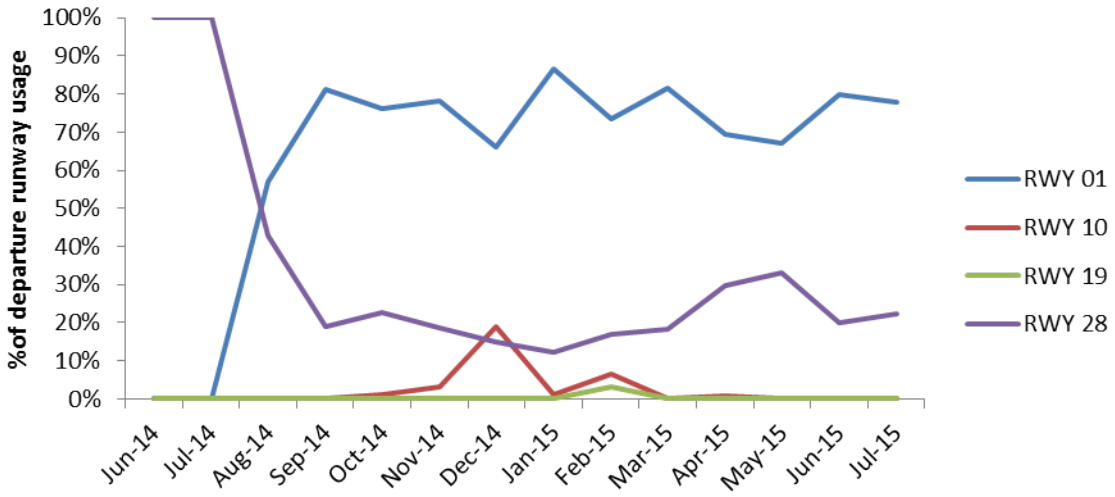


Figure A.4: Departure runway usage

Nighttime Runway Use Preferences

The SFO SOP also lists the preferred runway selection between the hours of 1am – 6am:

WEST PLAN		SOUTHEAST PLAN	
ARRIVALS	DEPARTURES	ARRIVALS	DEPARTURES
RWY 28	RWY 10	RWY 19	RWY 10
RWY 28	RWY 28	RWY 19	RWY 19
RWY 28	RWY 01	RWY 10	RWY 10
RWY 01	RWY 01		

Table A2: Night time SFO preferred runway usage (1am – 6am)
FAA Order SFO 7220.2J , CHG 1, Table 4-12

Figures A.5 and A.6 shows the arrival and departure runway usage between 1am – 6am. While RWY 10 is the preferred departure runway, Opposite Direction Operations (ODO), first implemented at SFO in August 2013, makes the use of RWY 10 for departures and RWY 28 for arrivals complicated, particularly at night. For safety considerations SFO Air Traffic Control Tower (ATCT) has avoided its use since 2013.

The data shows that, in west plan, the primary arrival runway at night is RWY 28 and the primary departure runway is split between RWY 01 and RWY 28. The estimated use of each runway configuration at night is shown in Figure A.7. The use of RWY 28 occurs when the demand is low enough to avoid additional ground delays by departing aircraft off the primary arrival runway.

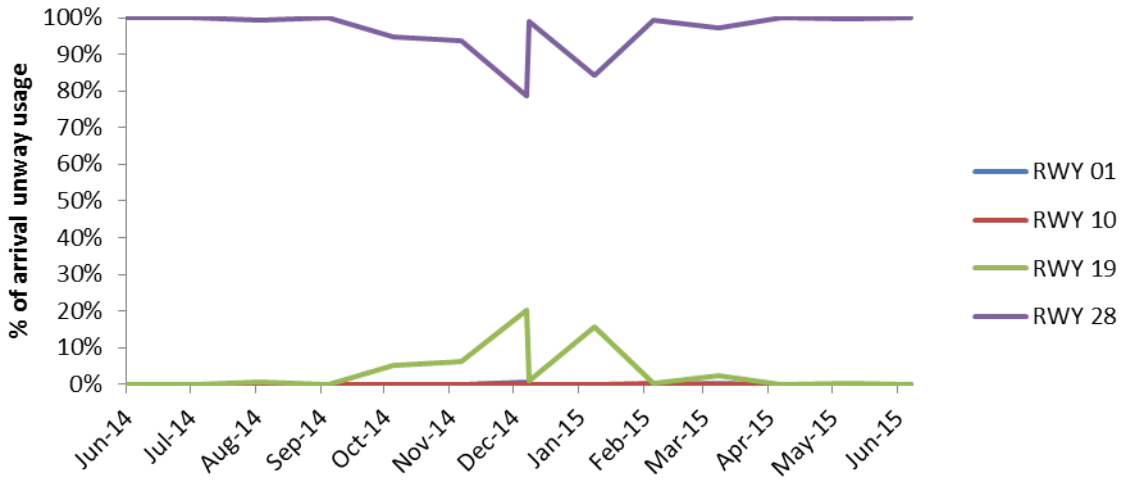


Figure A.5: Arrival runway usage between 1am – 6am

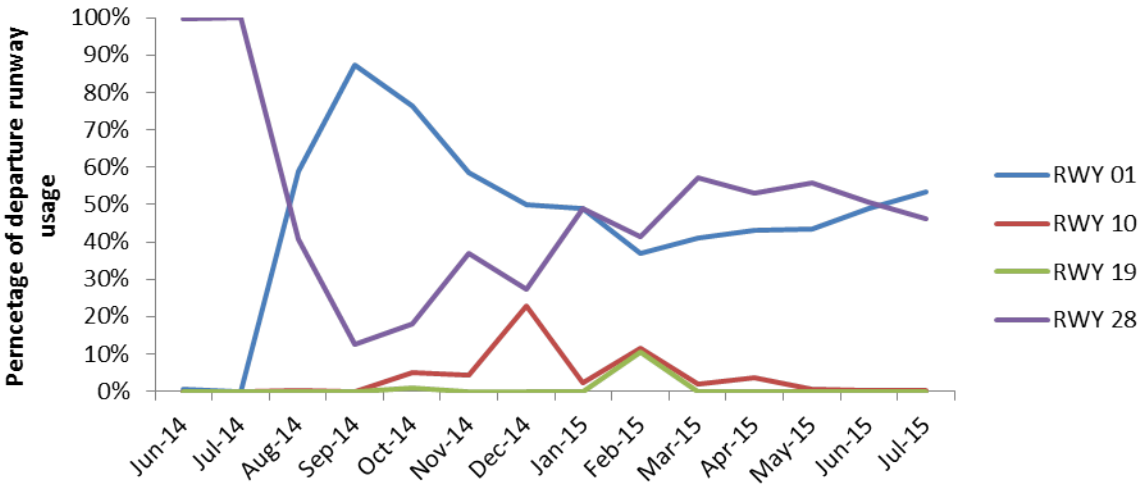


Figure A.6: Departure runway usage between 1am – 6am

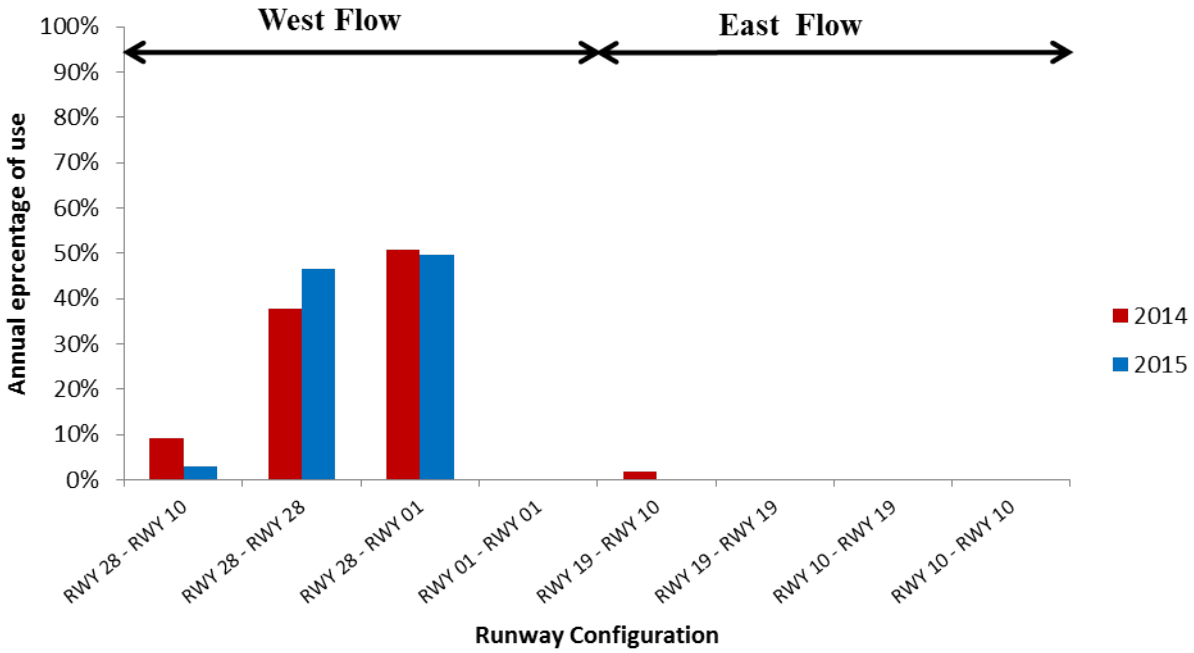


Figure A.7: Estimated runway configuration between 1am – 6am.

APPENDIX B

Daytime and Nighttime Departure Usage at SFO

Background:

The current interplay of the multiple departures and arrivals to/from the SFO and the other Bay Area airports has been extensively studied. The current set of departures, arrivals and standard operating procedures (SOP) provides the flow which best minimizes ground delays while complying with all safety criteria. Given the various separation criteria required in designing procedures, one procedure cannot be moved without affecting all of the other procedures from which it was originally separated. Adjusting one procedure causes a domino effect, potentially affecting all departure and arrival procedures associated with airports within the NorCal Airspace.

There is a difference between how a procedure is designed and how it is used, depending on the usage demands of the airspace. If there are more aircraft in the system than can be accommodated by the procedures, ATC has two options: to increase ground delays, or to ensure standard separation between aircraft in real-time by vectoring aircraft off the procedure. Given the volume of aircraft arriving and departing the Bay Area, it is often operationally necessary for ATC to vector aircraft off procedures to ensure safe spacing while mitigating ground delays throughout the National Airspace System.

Hourly Demand at SFO:

According to both the SFO Fly Quietly program and the NCT SOP, "nighttime" starts at 10pm and ends at 7am. NCT has automated the departure procedures so that the nighttime procedures, such as NIITE and HUSSH, are automatically issued for the north-bound flights after 10pm. These nighttime procedures are designed for periods of lesser operational demand, where ATC has the flexibility to keep aircraft in their airspace longer without compromising safety or increasing ground delays. However, the demand at SFO doesn't fall off until 12am, often due to daytime weather or demand related ground delays. This may cause flights with a daytime departure procedure issued before 10pm to be delayed such that they depart after 10pm. Furthermore, if the demand is too high to be accommodated by the nighttime procedures without ground delays, ATC may vector aircraft off the procedure.

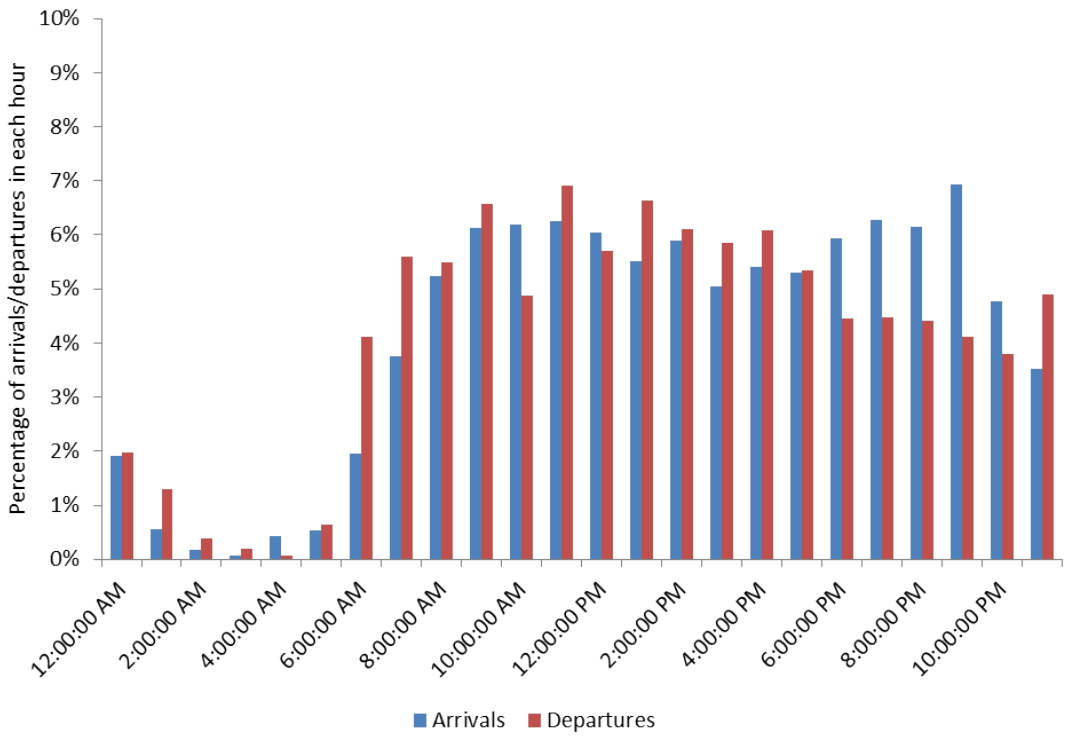


Figure B.1: Illustration of the average hourly arrivals and departures at SFO, July 2015.

Departure Procedure Usage at SFO

Figure B.2 compares the usage of SFO departure procedures in July 2014 to July 2015. The departure procedures are grouped together by the direction in which the departures are heading. Figure B.2 illustrates that the GAPP departure has been replaced by the GNNRR departure, and that the GAPP and the GNNRR service all westerly/northwesterly departing aircraft. As shown in Figure B.5, the GNNRR is an overlay of the GAPP departure tracks. For southerly departures, Figure B.2 indicates that the SSTIK departure has replaced usage of the PORTE departure. The Shoreline departure (SHOR) has been replaced by the TRUKN departure. While there still is some very minimal usage of the conventional procedures (REBAS, SFO3), the TRUKN is the primary departure to the north/northeast from 7am -10pm. The TRUKN was designed to keep as many flights to the East of Route 101[2] as possible. As shown in Figures B.3 and B.4, the percentage of TRUKN flights staying to the East of Route 101 is approximately the same as with the Shoreline 7 departure. Due to the closure of RWY 01 in July 2014, there are approximately ten-fold more Shoreline departures on RWY 28 in July 2014 than there were TRUKN RWY 28 departures in July 2015. Figure B.2 also shows that the CUIT nighttime departure has been replaced by the NIITE nighttime departure.

[2] This is one of the SFO Fly Quiet Ratings, see: http://www.flysfo.com/community-environment/noise-abatement/fly-quiet

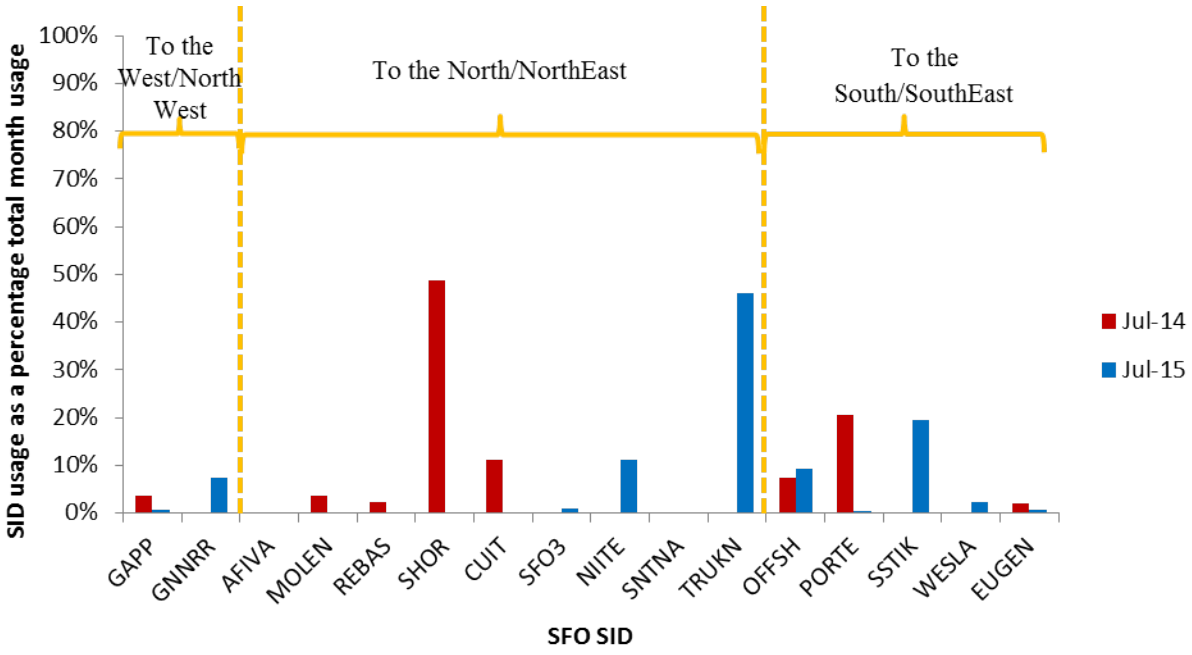


Figure B.2: Comparison of the departure procedure usage between July 2014 and July 2015.

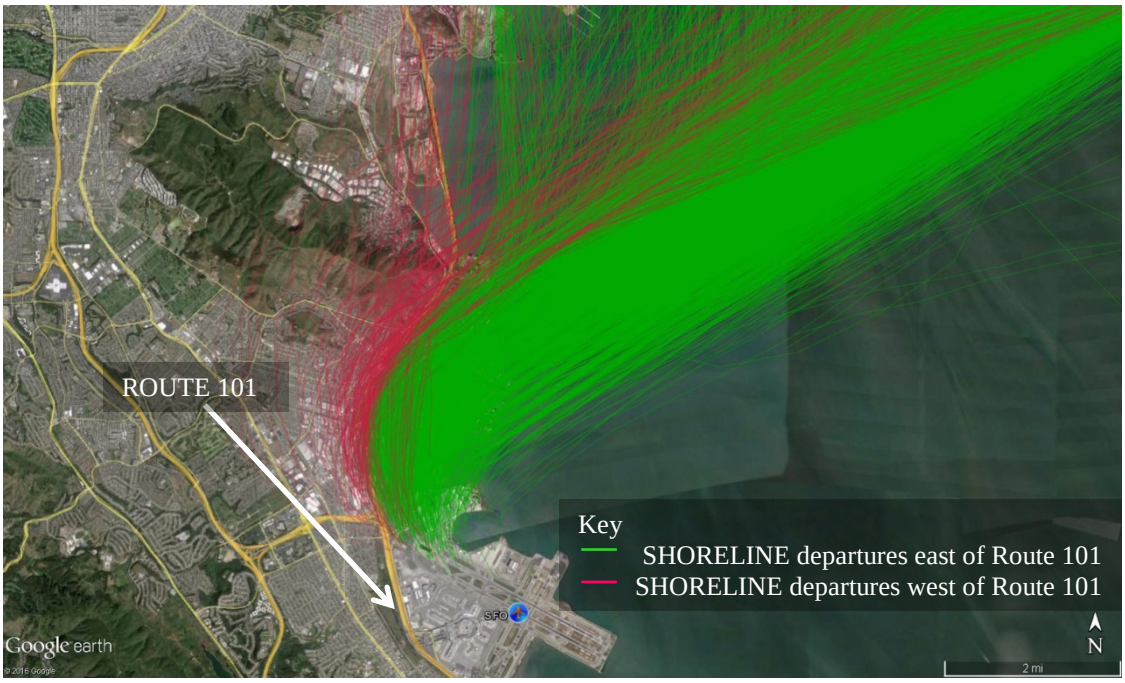


Figure B.3. Shoreline departures from RWY 28 in July 2014

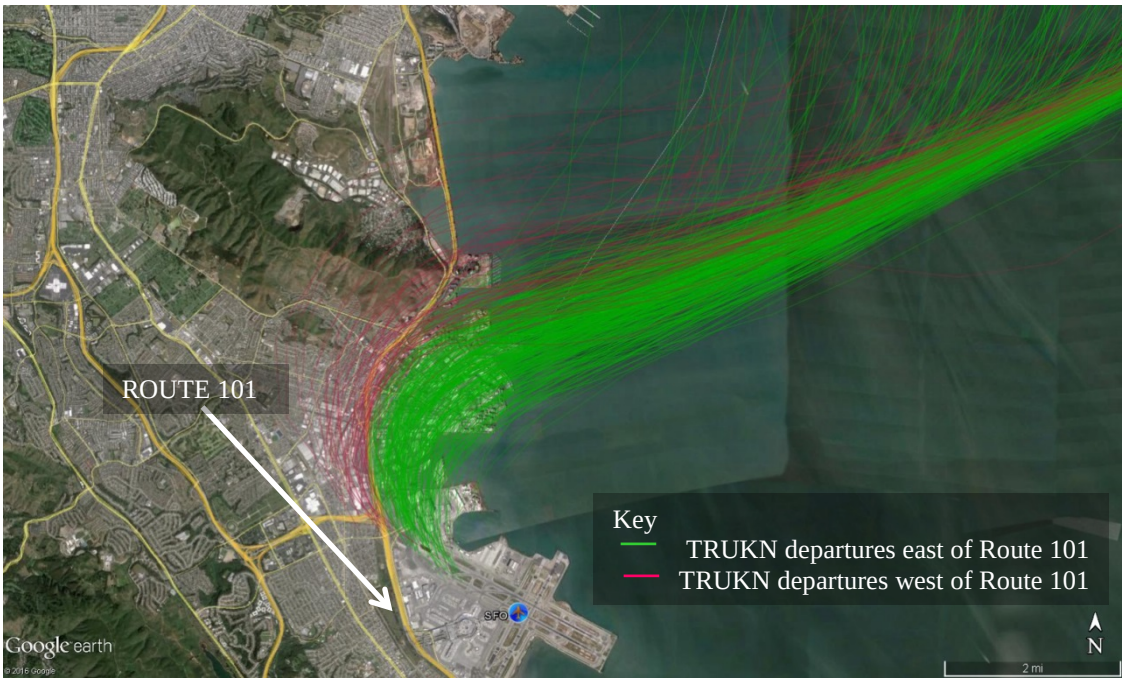


Figure B.4. TRUKN departures from RWY 28 in July 2015

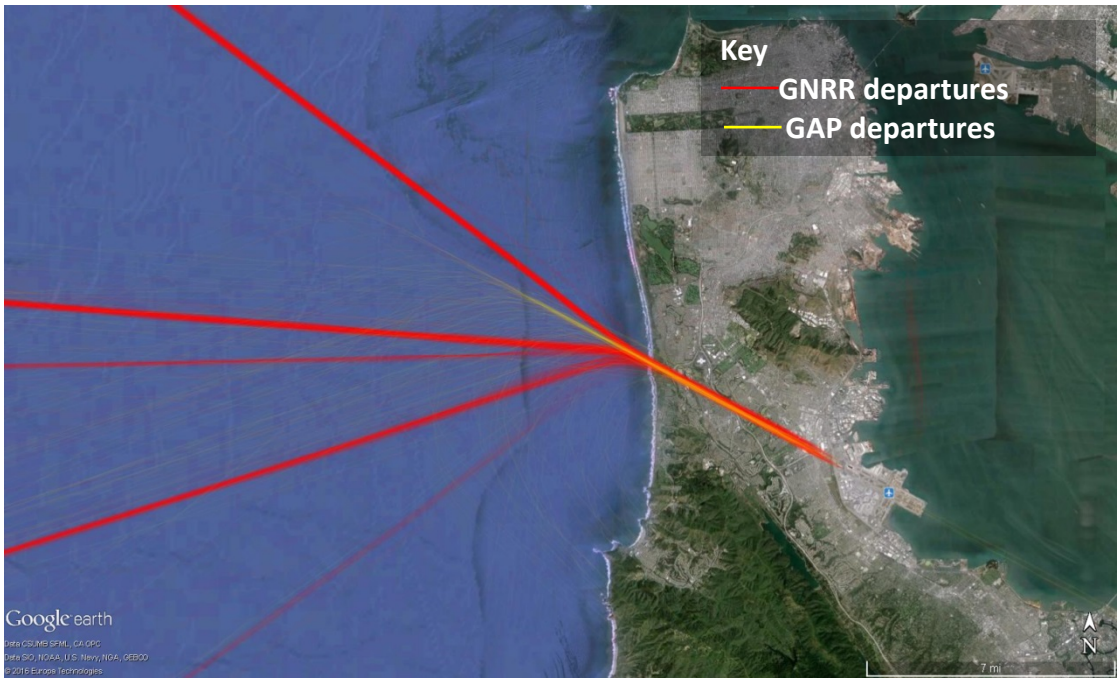


Figure B.5. GAPP and GNNRR departures, July 2015

Nighttime SFO Departure Procedure Usage

Figures B.6 and B.7 respectively illustrates the departure procedure usage at "night" according to the SFO Fly Quietly program and by NCT SOP (10pm – 7am), and during the "night" defined by the SFO SOP (1am – 6am). The departure procedures are grouped together by the direction in which the departures are heading.

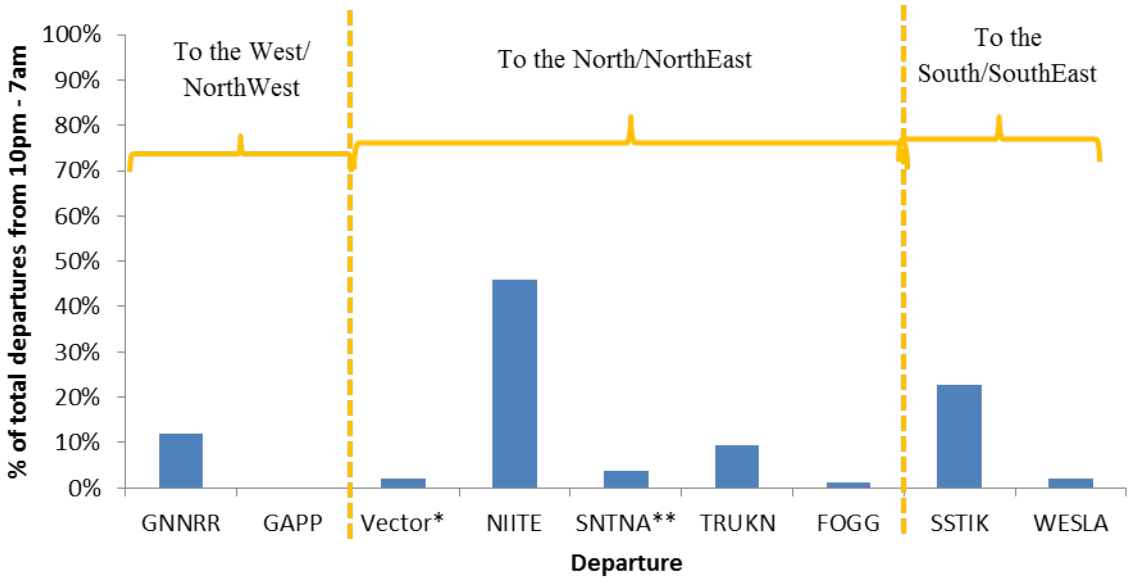


Figure B.6: SFO departure usage from 10pm – 7am, July 2015.

*These departures are vectored off RWY 01 on a 050 heading.

** The SNTNA departure is only used when necessary for heavy international fights, or when there are strong westerly winds.

A comparison between Figures B.6 and B.7 show that the TRUKN departures only occur outside of 1 am – 6am. These flights are likely due to the push of departure aircraft between 10pm – 12am that were delayed from before 10pm.

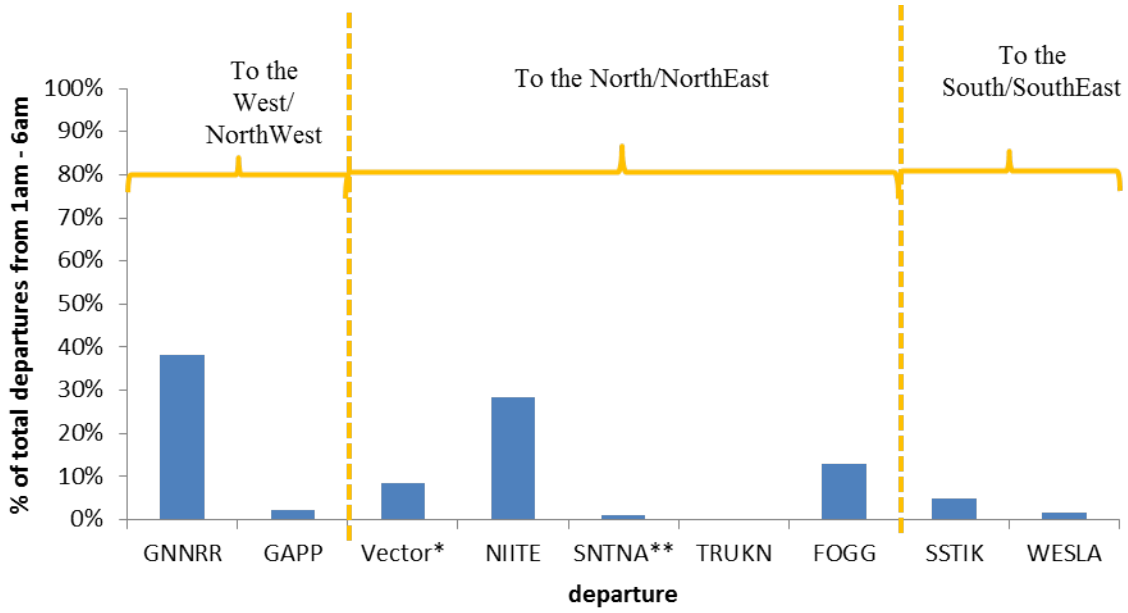


Figure B.7: SFO departure usage from 1am - 6 am, July 2015.

*These departures are vectored off RWY 01 on a 050 heading.

** The SNTNA departure is only used when necessary for heavy international fights, or when there are strong westerly winds.

Usage of the NIITE Departure

The primary departure procedure to the north/northeast at night (10pm – 7am) is the NIITE departure. According to ATC, a RWY 10 transition to NITTE was designed and published, however, upon implementation, the transition was removed due to safety concerns.

Figure B.8 shows the NIITE departure plate. There is also a nighttime departure from OAK, the HUSSH departure, which merges with the NIITE departure at the HUSSH waypoint. Figure B.9 shows the hourly usage of the NIITE departure between 10pm and 7am.

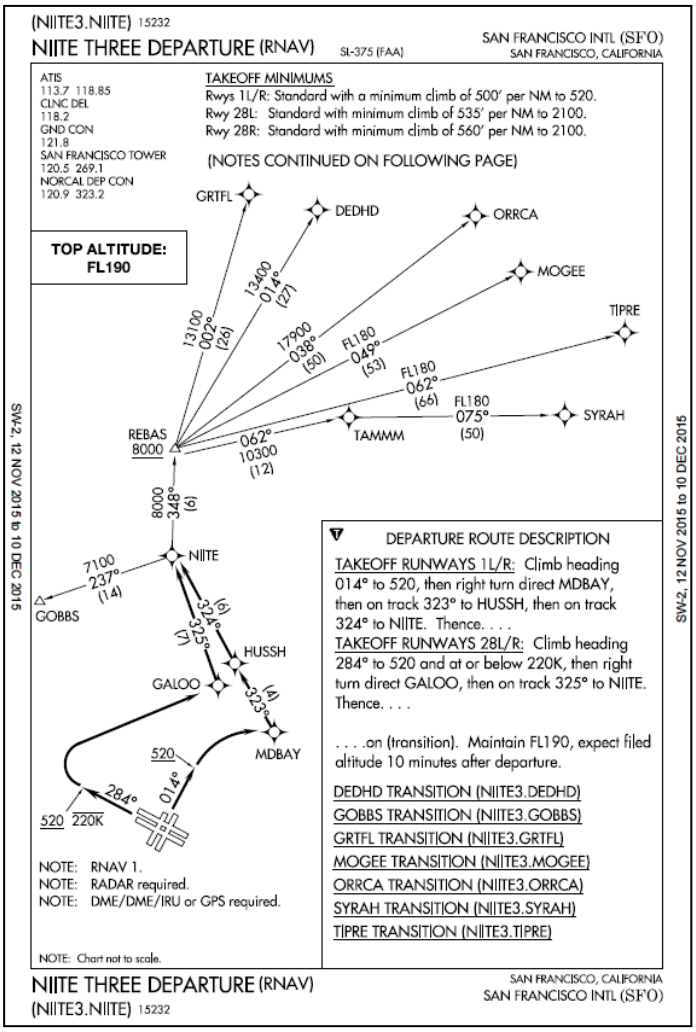


Figure B.8: the NIITE departure

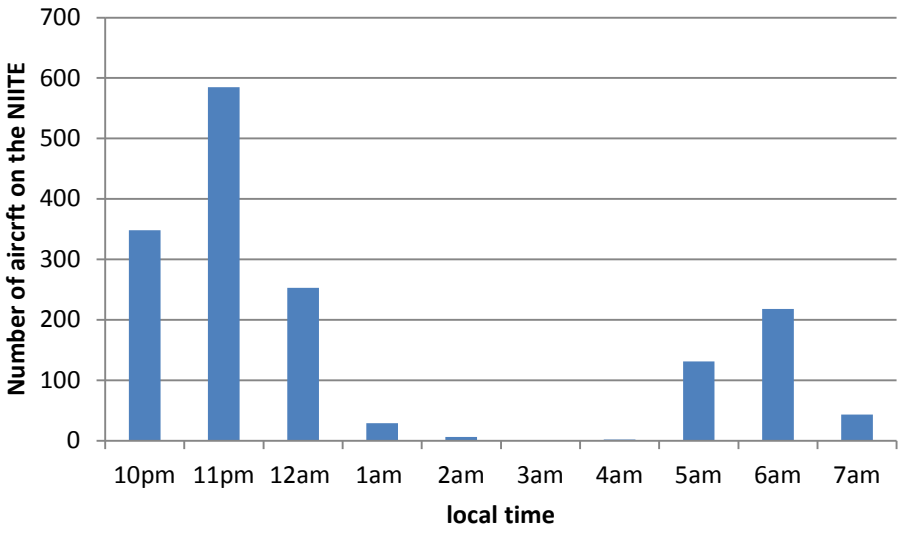


Figure B.9: Hourly usage of the NIITE departure

Figure B.10 shows the percentage of NIITE flights which are less than 3NM from another aircraft at HUSSH. This gives an indication of the ability of ATC to keep flights on the NIITE or the need to vector them off.

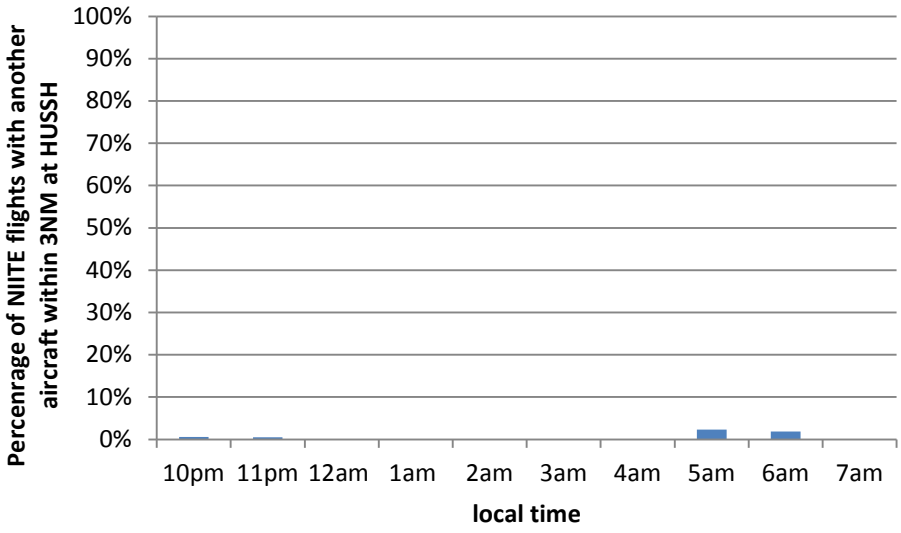


Figure B.10: Percentage of NIITE flights which are within 3NM of another flight

The NIITE is an RNAV 1 procedure. For the purposes of this analysis, an aircraft was considered on the procedure if it was within 1NM of the procedure. Figure B.11 shows the percentage of NIITE flights which are vectored off the NIITE departure prior to reaching the NIITE waypoint. During the busier times (10pm -12am, and after 6am), approximately 25% of flights get vectored off the NIITE departure. The low number of aircraft within 3NM from any NIITE departure between 10pm – 12am may be due to vectoring, which allows more flexible separation. However when the demand on the NIITE decreases, between 1am and 4am, approximately 50% of flights still get vectored off the NIITE departure.

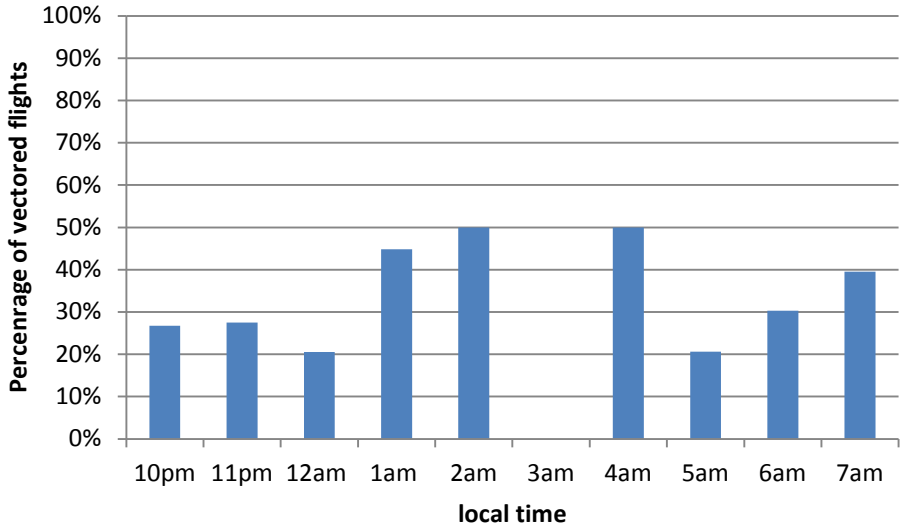


Figure B.11: Percentage of NIITE flights which remain on the NIITE departure until at least the NIITE waypoint

Usage of the SSTIK, CNDEL, WESLA and OFFSH Departures

During July 2015, 96% of all SFO south bound departures either utilized the SSTIK, WESLA or the OFFSH departures. The SSTIK serviced RWY 01; the WESLA departure services RWY 28, and joins the SSTIK departure at the PORTE waypoint. The OFFSH departure is a conventional procedure that flies near the PORTE waypoint and then continues offshore. The SSTIK and WESLA YYUNG transition was intended to replace the OFFSH, however these transitions are no longer in use since they flew too close to a restricted area in Oakland Center (ZOA) airspace.

Figures B.12 – B.15 show images of all flights on the SSTIK, WESLA, CNDEL and OFFSH, respectively, flown in July 2015. These images also depict a circle around the last waypoint/ fix prior to the procedure turning south. This circle depicts the area in which these flights should be within to be considered on the procedure. While between 99% - 100% of SSTIK, WESLA and OFFSH flights are within their respective circles, only 46% of the CNDEL departures are on the procedure at the waypoint prior to turning south. It may be possible to delay the vectoring of CNDEL departures until after the CNDEL waypoint.

Figure B.12 shows all of the SSTIK departures in July 2015. The SSTIK is an RNAV 1 procedure. For the sake of this analysis, an aircraft was considered on the procedure if it was within 1NM of the procedure. FAA's analysis indicates that 99.9% of all SSTIK departures fly within 1 NM of the SSTIK waypoint.

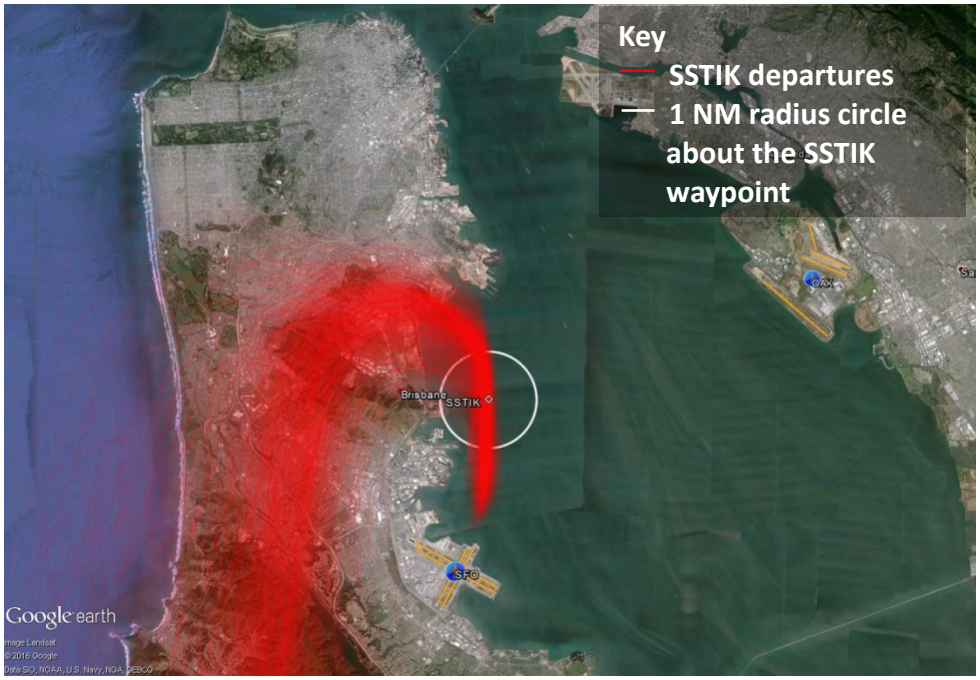


Figure B.12: SSTIK departures July 2015

Figure B.13 shows all of the WESLA departures in July 2015. The WESLA is also an RNAV 1 procedure. The FAA's analysis shows that 99.6% of all WELSA departures fly within 1 NM of the WESLA waypoint.

Figure B.13: WESLA departures July 2015

Figure B.14 shows all of the CNDEL departures in July 2015. The CNDEL is also an RNAV 1 procedure. FAA's analysis indicates that 85.1% of all CNDEL departures fly within 1 NM of the LEJAY waypoint and 45.6% flew within 1NM of the CNDEL waypoint.

Figure B.14: CNDEL departures July 2015

Figure B.15 shows all of the OFFSH departures in July 2015. Given that the initial portion of a conventional departure is typically designed with a safety buffer of 2NM, for the purpose of this report, an aircraft was considered on the procedure if it was within 2NM of the first fixes on the procedure. FAA's analysis indicates that 100.0% of all OFFSH departures flew within 2 NM of the first fix on the RWY 01 and RWY 28 transitions.

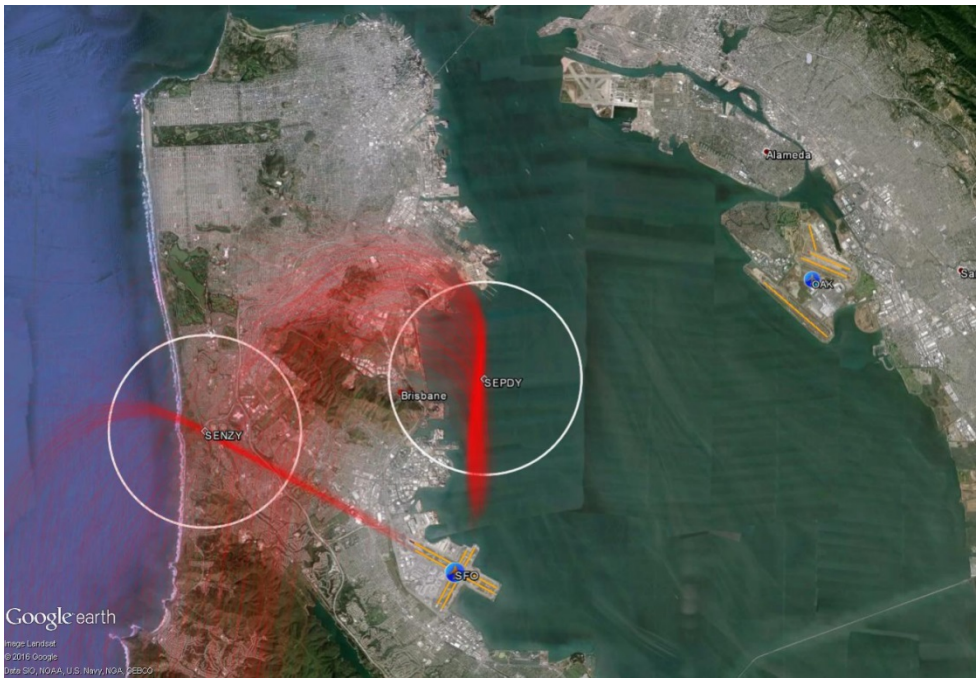


Figure B.15: OFFSH departures July 2015

Figures B.9 and A.10 illustrates the usage of departures from SFO between the hours of 10pm – 7am and between 1am – 6am respectively. There is some use of the SSTIK departure during these time periods. Figure B.16 below shows the hourly use of the SSTIK, for July 2015. This indicates that the SSTIK use is minimized during 1am – 6am. The percentage use of the SSTIK from 10pm – 12pm is due to daytime delayed aircraft.

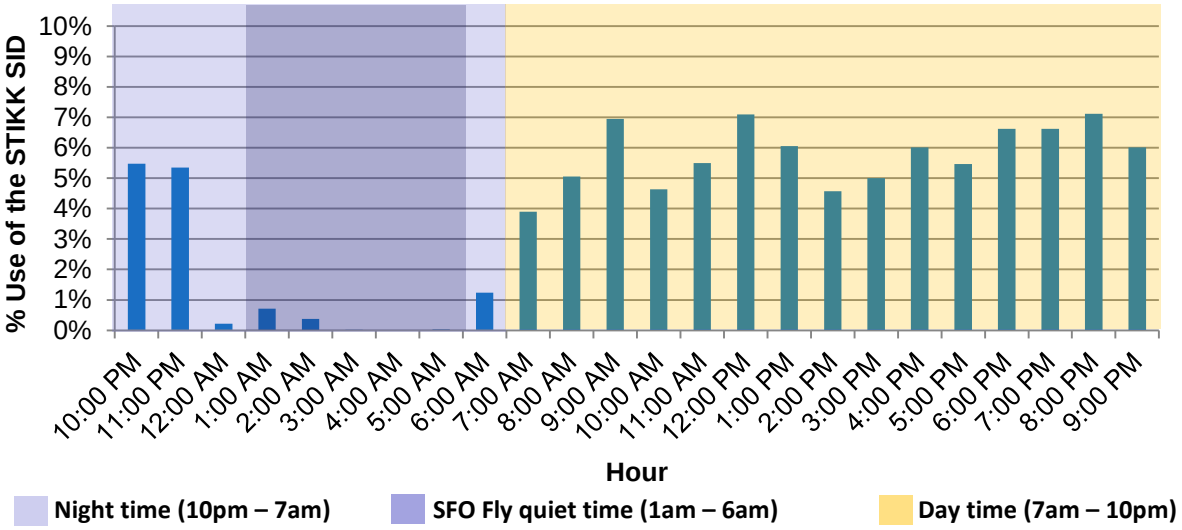


Figure B.16: Hourly usage of the SSTIK departure

As illustrated in Figures B.12 – B.15, after passing the first one or two waypoints, the south bound departures are dispersed over wide lateral and altitude range. Figures B.17 and B.18 illustrate the dispersion of the southern departures over the PORTE waypoint. There is a shift in the average altitude of the OFFSH departure from 2014 to 2015, as seen in Figure B.17. This is likely due to the principal departure runway changing from RWY 28 to RWY 01. The RWY 01 departures fly more directly over PORTE than RWY 28 departures and therefore have lower altitudes.

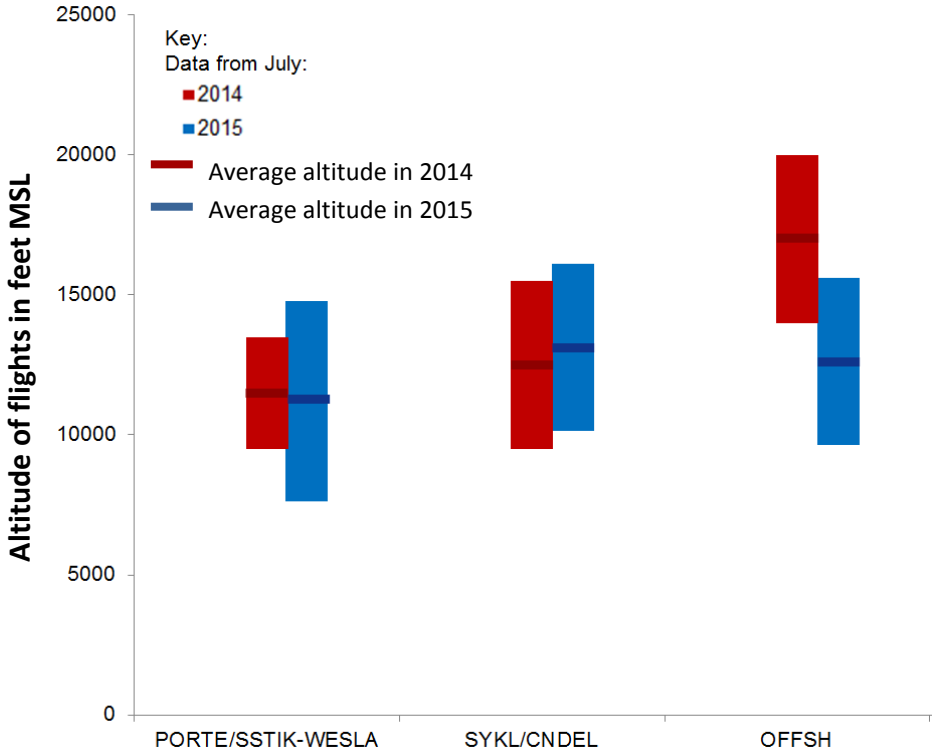


Figure B.17: Vertical dispersion of south bound departures in July 2014 and July 2015

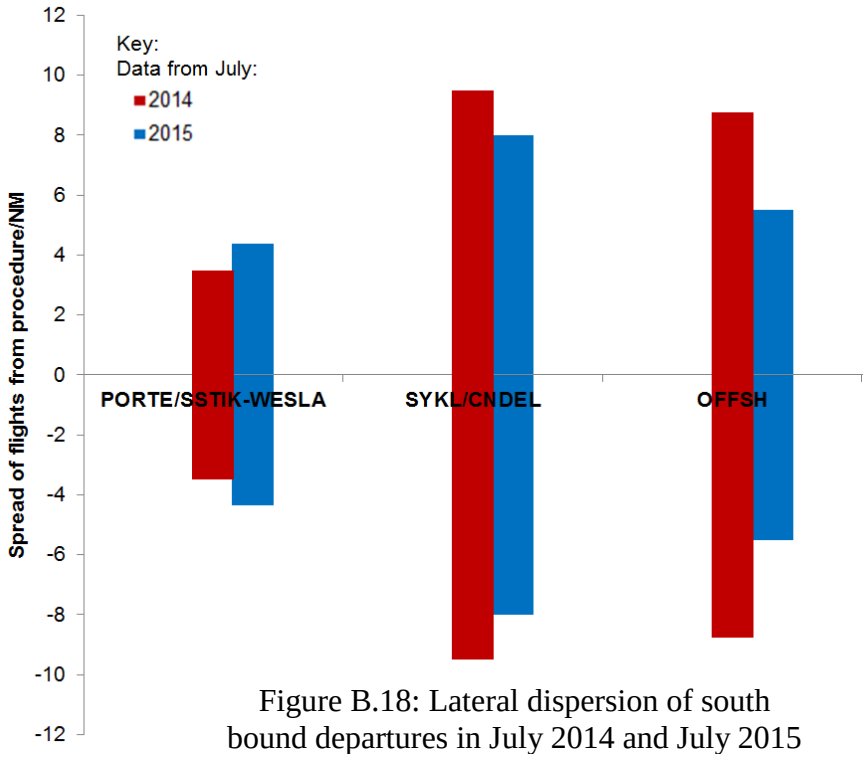


Figure B.18: Lateral dispersion of south bound departures in July 2014 and July 2015

APPENDIX C

Approaches into SFO

A study was undertaken regarding the types of approaches into RWY 28R during visual conditions. It was found that for July 2015, approximately 66% of the flights arrive into RWY 28R on an offset approach. The remaining 34% are straight in approaches. The FMS Bridge is a coded "special" visual off-set approach, which is advertised as the preferred approach into RWY 28R, along with the Instrument Landing System approach (ILS). A "special" is a type of procedure that is developed and paid for privately, normally by an airline. Other airlines can use the "special" procedure as long as they pay the private entity that owns it. The ILS is also advertised as a preferred approach option for those airlines that do not have the option of using the FMS Bridge.

It was found that 50% of the airlines arriving RWY 28R during VMC do not use the offset. Given that these airlines only represent 6% of the VMC arrivals, it was induced that these airlines do not have access to the FMS Bridge.

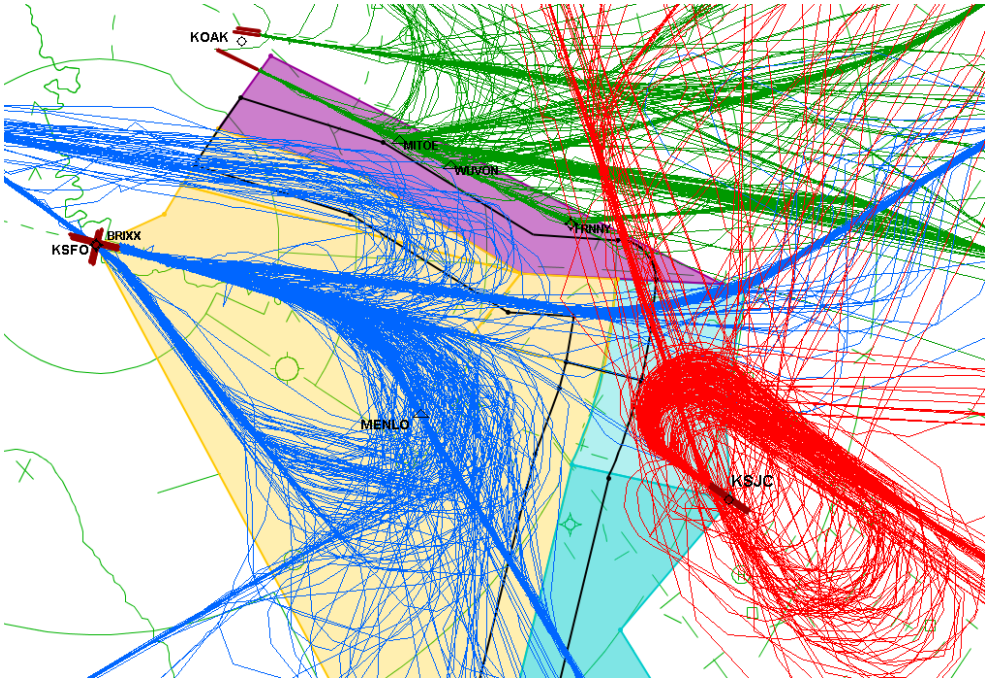
The remaining 50% of airlines utilize the offset approach 77% of the time. It may be that the remaining 23% of arrivals occur during higher demand when dual approaches to RWY 28R/L are necessitated. During these simultaneous arrivals, the offset approach into RWY 28R is not available.

Figure C.1: Arrivals into RWY 28R in July 2015 during visual conditions.

APPENDIX D
Amendments to the SERFR Arrival

Moving the MENLO Waypoint

During the design phase of the SERFR Arrival, modeling of the altitude at MENLO showed the range of aircraft represented by the lead carriers would have an optimum descent between 2.72° to 2.85°. With the altitude restriction of MENLO at 4,000 feet, the descent gradient to RWY 28L is 2.85°. MENLO cannot be any higher without introducing a safety risk to the descending aircraft. The TipToe Approach is a visual approach with an altitude restriction of 5,000 feet at MENLO. This is achievable with a visual approach as the regulations state that flight crews are able to maneuver to lose altitude when on a visual approach, prior to being established on the final approach course. The same is not true on an instrument approach. Figure D.1 below illustrates a day of traffic into SFO, OAK and SJC along with the individual ATC sector boundaries. The traffic within one sector is kept 1.5 NM away from the sector boundaries for safety. The black lines in Figure D.1 illustrate this 1.5NM buffer. Were MENLO to be moved north, this would interfere with OAK arrival streams. Were MENLO to be moved to the west, the SFO arrival stream may affect the SJC departure stream.



KEY:

SFO arrivals

OAK arrivals

Sector responsible for SFO

SJC departures

Sector responsible for SJC

Sector responsible for OAK

Traffic in each area needs to be separated by 3NM. The black lines show 1.5 NM from each side of the boundary.

Figure D.1: A day's worth of interactions between SFO arrivals, OAK arrivals and SJC departures.

Community Suggestion: Move EPICK waypoint south to approximately 36 54 52.8N and 121 56 32.7W, add a 280 knots speed restriction and an altitude restriction of 15,000'

Figure D.2: The proposed relocation of the EPICK waypoint

Figures D.3 and D.4 below indicate that at the proposed EPICK relocation, the aircraft are typically lower and likely faster than what is being proposed. The proposed restrictions would result in too steep a descent gradient for most of the more modern aircraft fleet currently servicing SFO.

Furthermore, given aircraft have different characteristics; an OPD is often designed with altitude windows to provide enough flexibility so that each aircraft is able to perform an idle descent. Specifying hard altitude and/or speed restrictions would make an idle descent impossible.

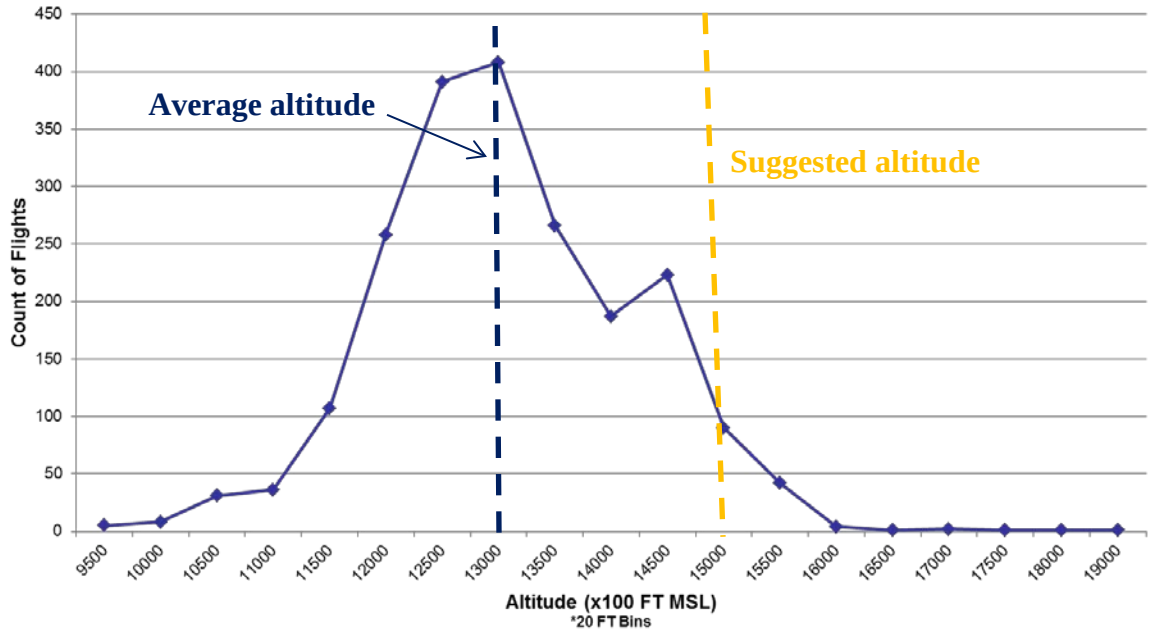


Figure D.3: The altitudes of July 2015 SERFR aircraft at the proposed EPICK waypoint

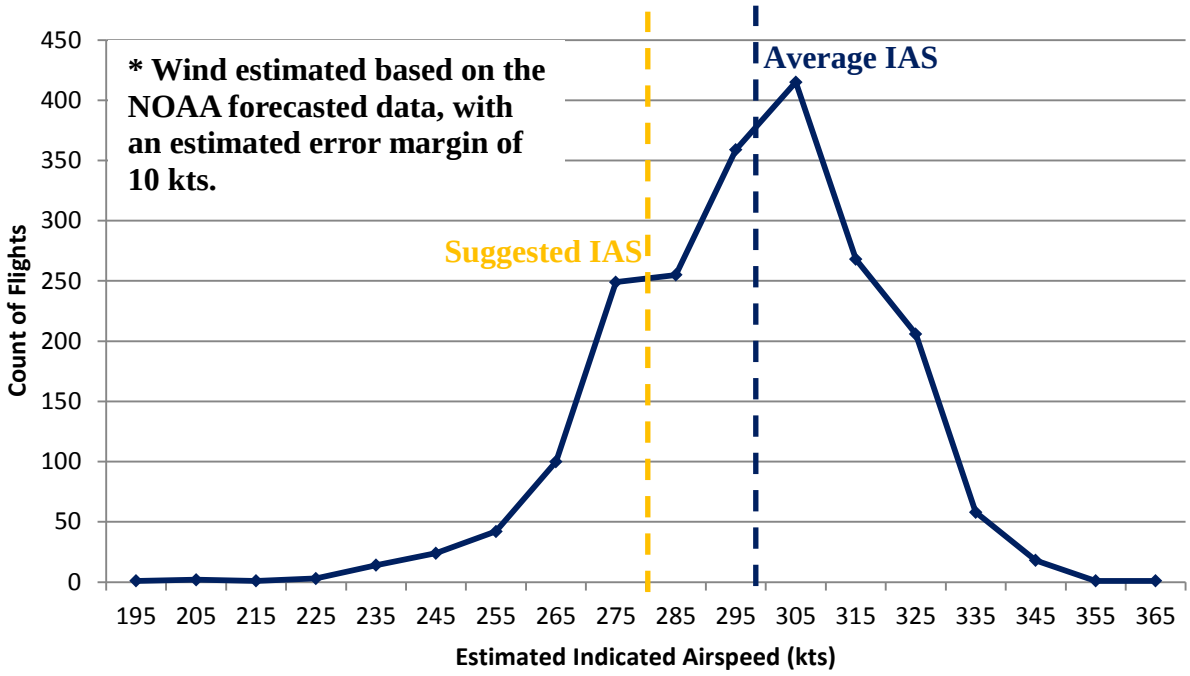


Figure D.4: The estimated IAS of July 2015 SERFR aircraft at the proposed EPICK waypoint

Community Suggestion: Evaluate adding a new waypoint roughly over the Highway 17 summit area, between EPICK and EDDYY, with at least 10,000 feet MSL altitude and 250 knot restriction.

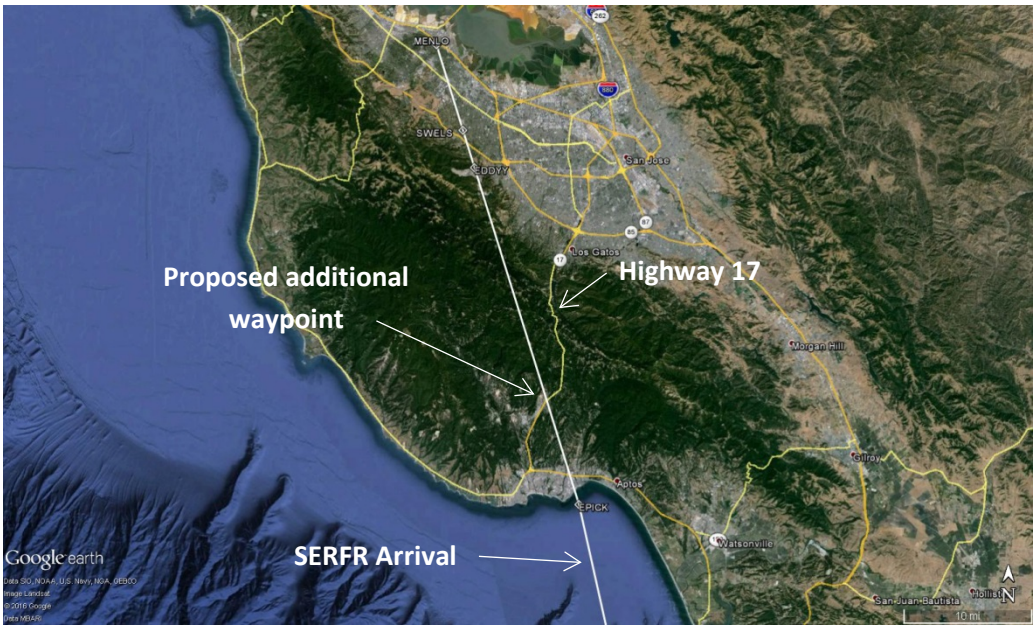


Figure D.5: The proposed additional waypoint

Figures D.6 and D.7 indicate that while aircraft currently fly the proposed altitude at the proposed additional waypoint location, the aircraft are typically at higher estimated IAS. Even once the Class B airspace is redesigned to optimized use of the OPD on the SERFR arrival, establishing this additional waypoint would likely result in aircraft needing to slow down. Artificially restricting the descent of aircraft on the OPD will likely mean that those aircraft are taken off the OPD.

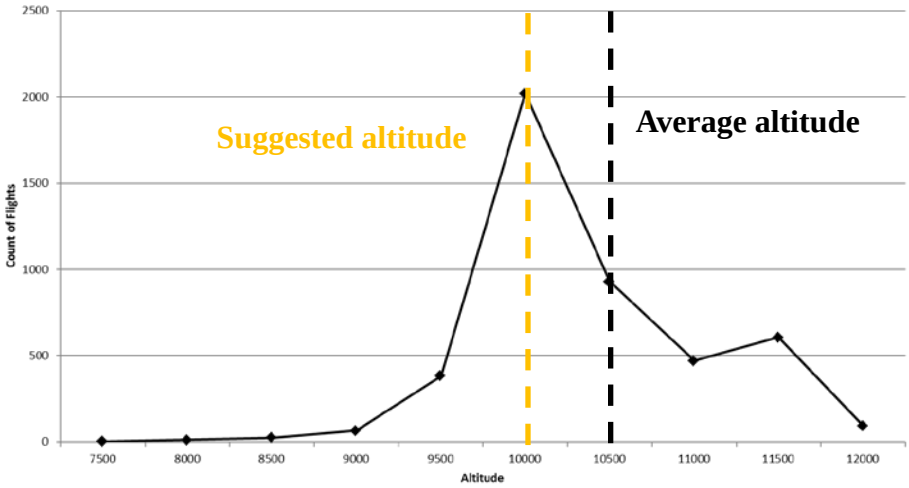


Figure D.6: The altitude of July 2015 flights on SERFR arrival at the proposed additional waypoint

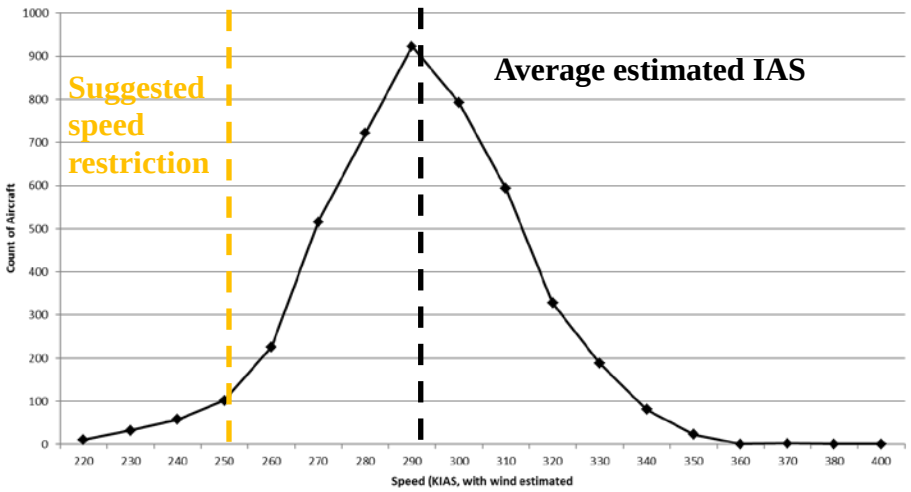


Figure D.7: The estimated IAS of July 2015 SERFR aircraft at the proposed additional waypoint

Community Suggestion: New SERFR STAR, using community identified waypoint DAVYJ, shifting the SERFR to the BSR, with additional waypoints with constraints:

- Waypoint 1: 16,000 FT and 280 KIAS
- Waypoint 2: 10,000 FT and 250 KIAS
- Waypoint 3: 8,000 FT

Figure D.8 illustrates the proposed amendment of the SERFR arrival back to the BSR ground track.

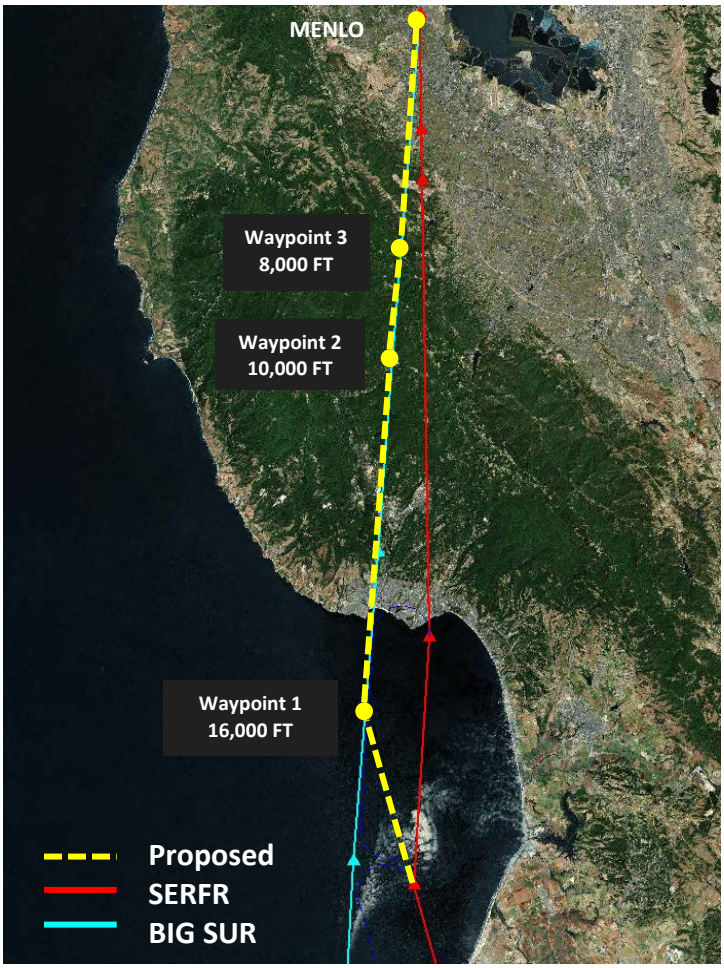


Figure D.8: The proposed shift from the SERFR arrival back to the BSR ground track

Figures D.9, D.11 and D.13 all illustrate minimal conflicts in moving the SERFR traffic back over to the BSR. All traffic equipped to fly an RNAV STAR are assigned the SERFR. All traffic not equipped are assigned the BSR.

Figures D.10, D.12 and D.14 illustrate the average altitude of SERFR flights at the proposed waypoints locations. These altitudes roughly correspond with the proposed altitudes, more so downstream.

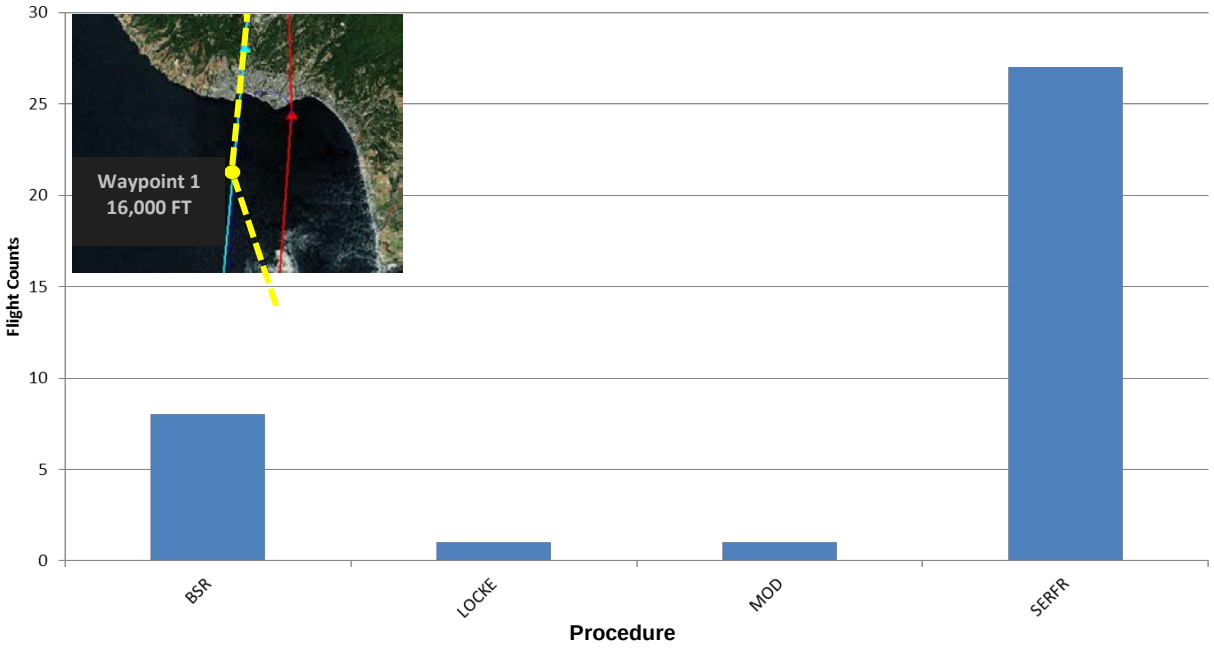


Figure D.9: The traffic activity in the vicinity of the proposed waypoint 1.

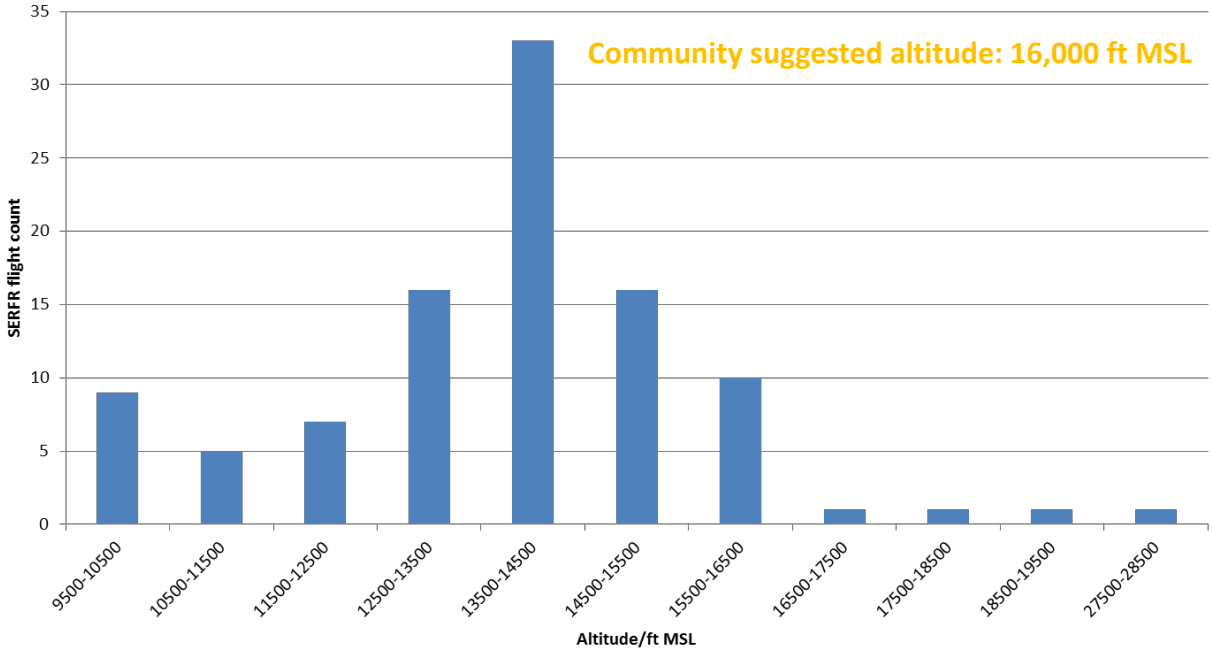


Figure D.10: SERFR arrival altitudes at waypoint 1

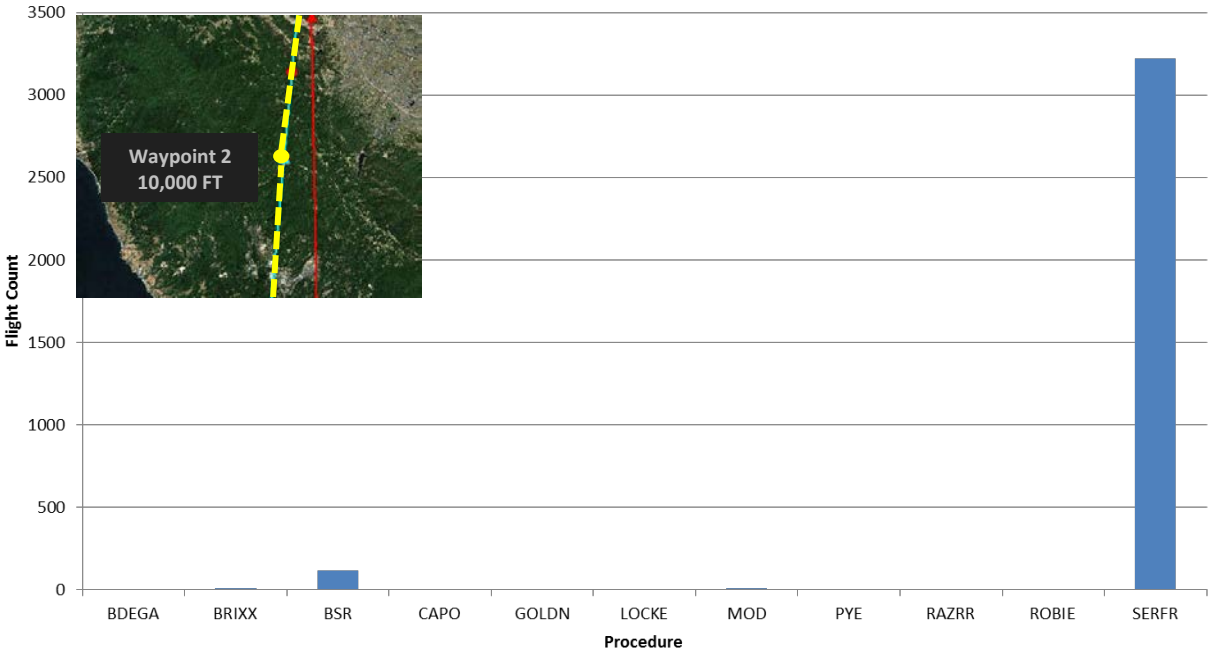


Figure D.11: The traffic activity in the vicinity of the proposed waypoint 2.

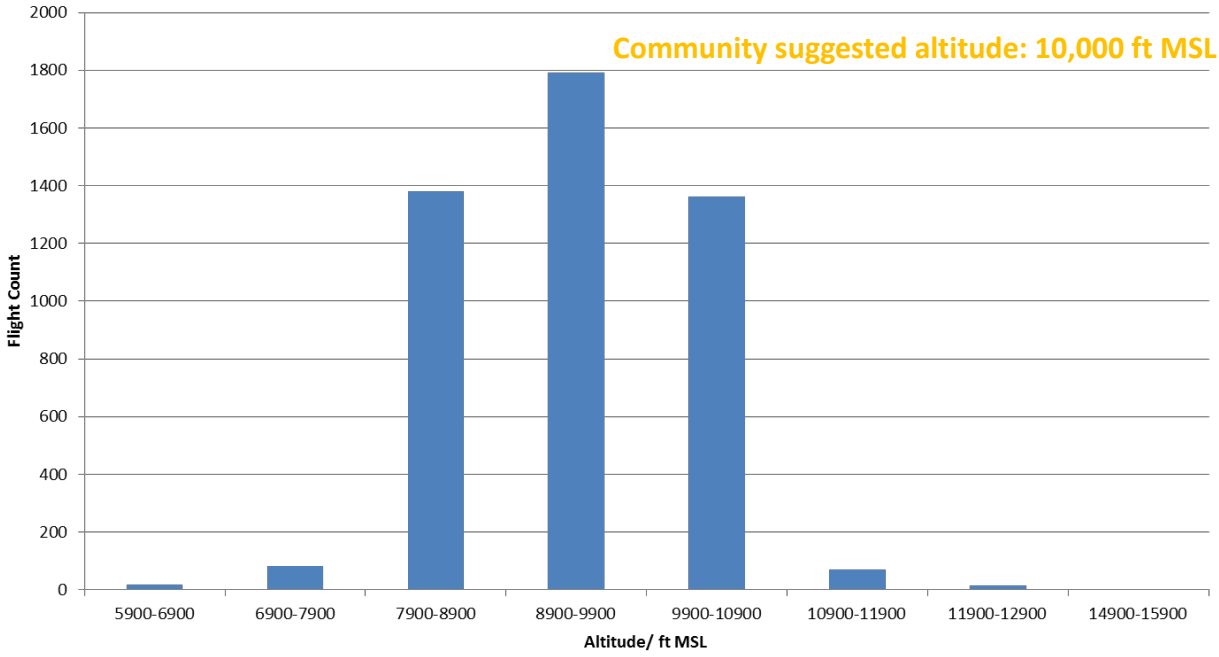


Figure D.12: SERFR arrival altitudes at waypoint 2

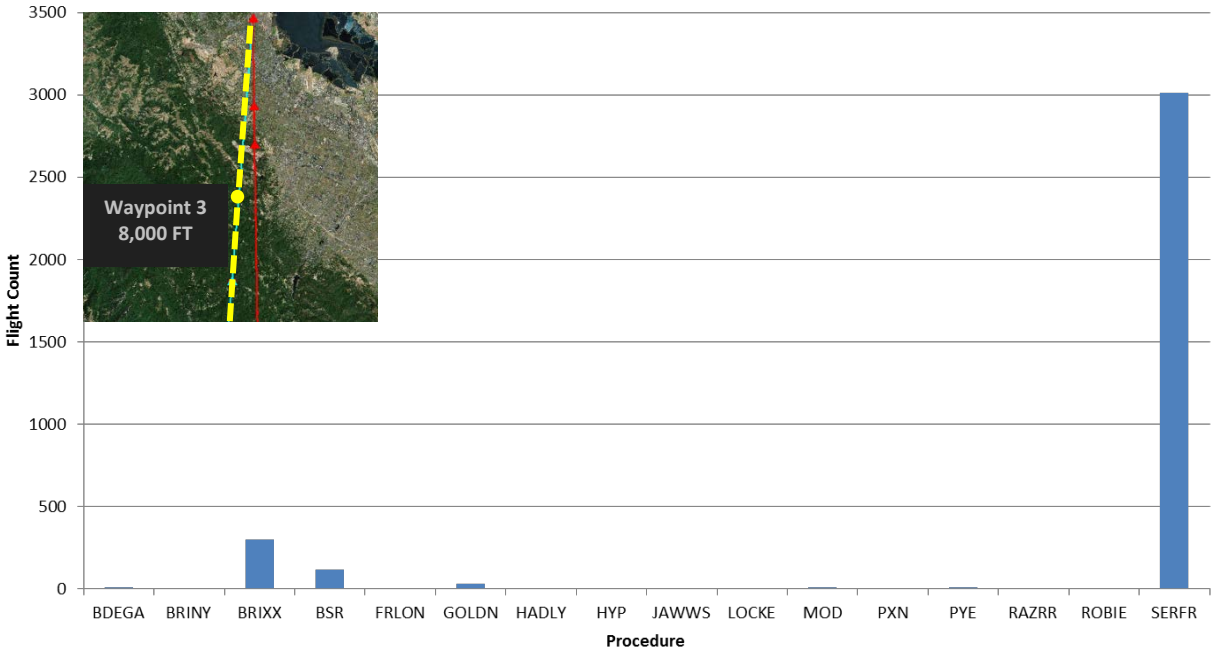


Figure D.13: The traffic activity in the vicinity of the proposed waypoint 3.

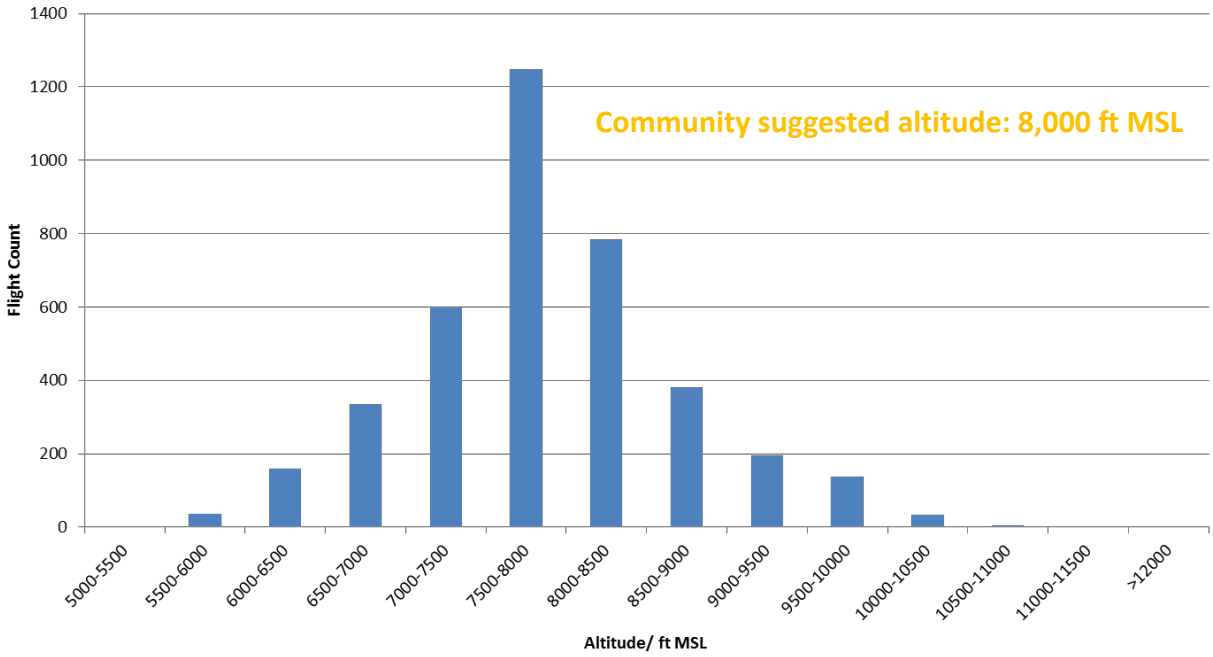


Figure D.14: SERFR arrival altitudes at waypoint 3

SERFR Holding Patterns Analysis

Figure D.15 below indicates the usage of the holding patterns at the waypoints SERFR, NRRLI, WWAVS and EPICK. This analysis indicates that 0.31% of flights utilize the holding patterns at EPICK.

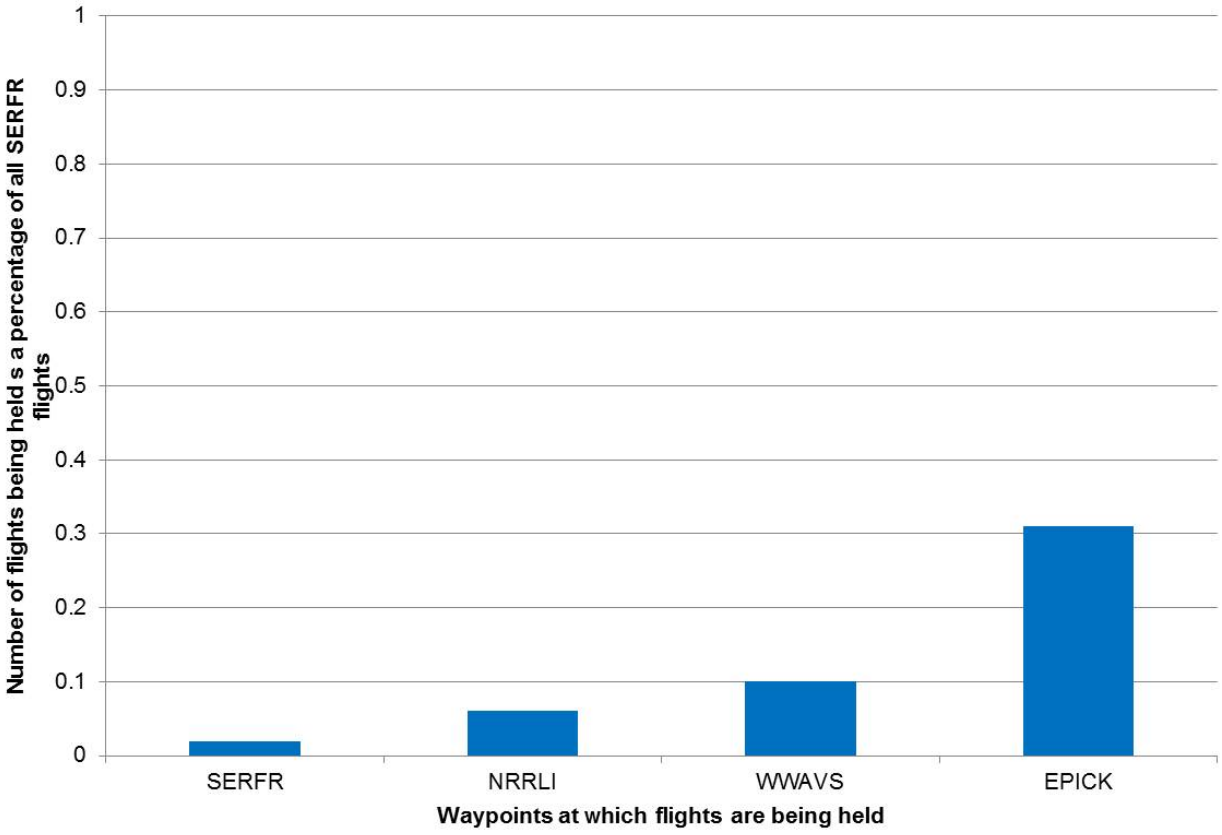


Figure D.15: Holding patterns usage on the SERFR

APPENDIX E

Usage of the SERFR Arrival

Vectoring on the SERFR

Figure E.1 show the ground track of all flights on the BSR in July 2014 and all flights on the SERFR in July 2015. As illustrated by these images, many of the BSR and SERFR flights were vectored off the procedure.

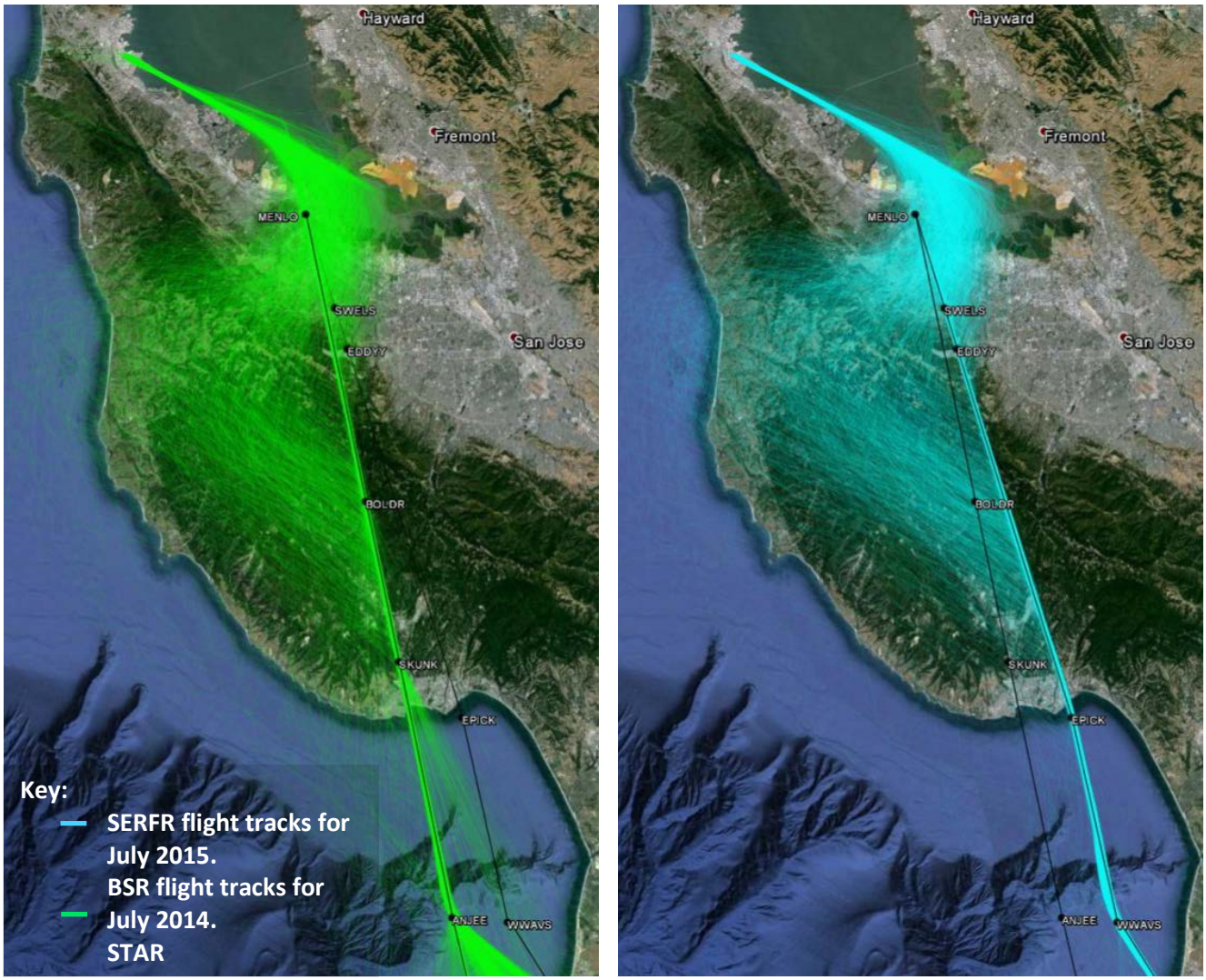


Figure E.1: Comparison of how the BSR and the SERFR were flown

Figure E.2 illustrates from which waypoint this vectoring occurs. For both the BSR and the SERFR, approximately 50% of the traffic is vectored off the procedure.

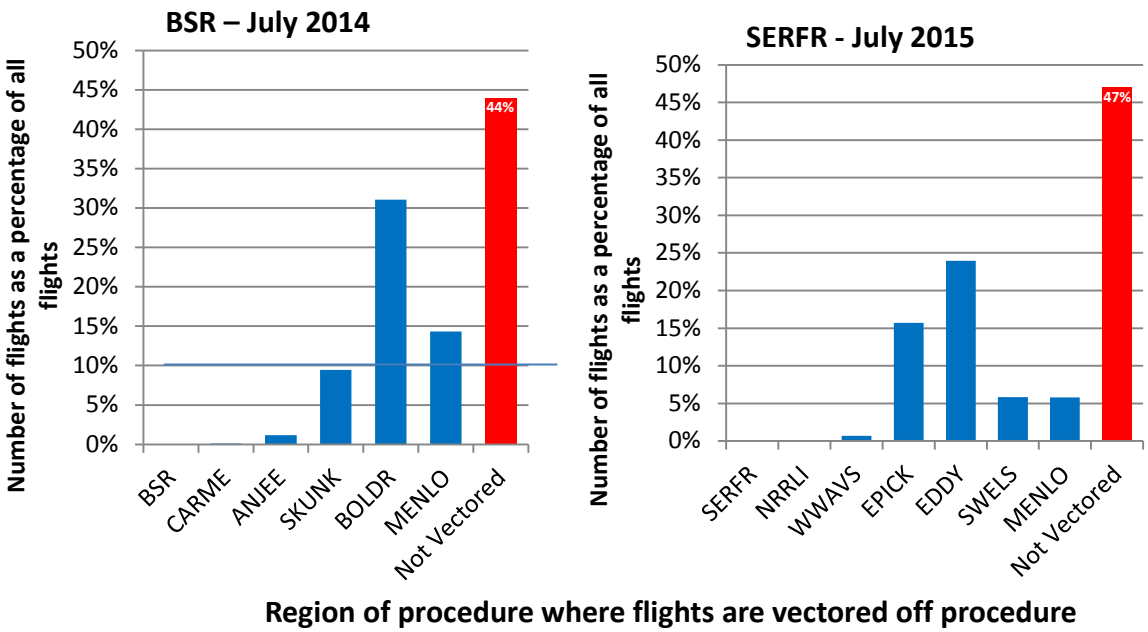


Figure E.2: Comparison of where the flights on the BSR and SERFR were vectored off

Speed Changes on the SERFR

Track data provides the ground speed of an aircraft. However, it is Indicated Air Speed (IAS) which is monitored in the cockpit, and the unit of procedural restrictions. The difference between an aircraft's ground speed and IAS is a non-linear function of wind velocity and air pressure. Given the large temporal and spatial variability in these factors, IAS is virtually impossible to calculate using ground speed. For rough trending purposes, the change in ground speed was obtained for aircraft on the SERFR. This is shown in Figure E.3 below. It was found that on average, aircraft ground speed on the SERFR in the vicinity of EPICK is slowing down. It is not possible to derive what causes the slowing down from the ground speed data alone. Flying at 280K IAS at 20,000ft will be faster over ground than 280K IAS at 10,000ft. This differential, coupled with changes in wind speed /direction, is the most likely reason for the apparent ground speed deceleration.

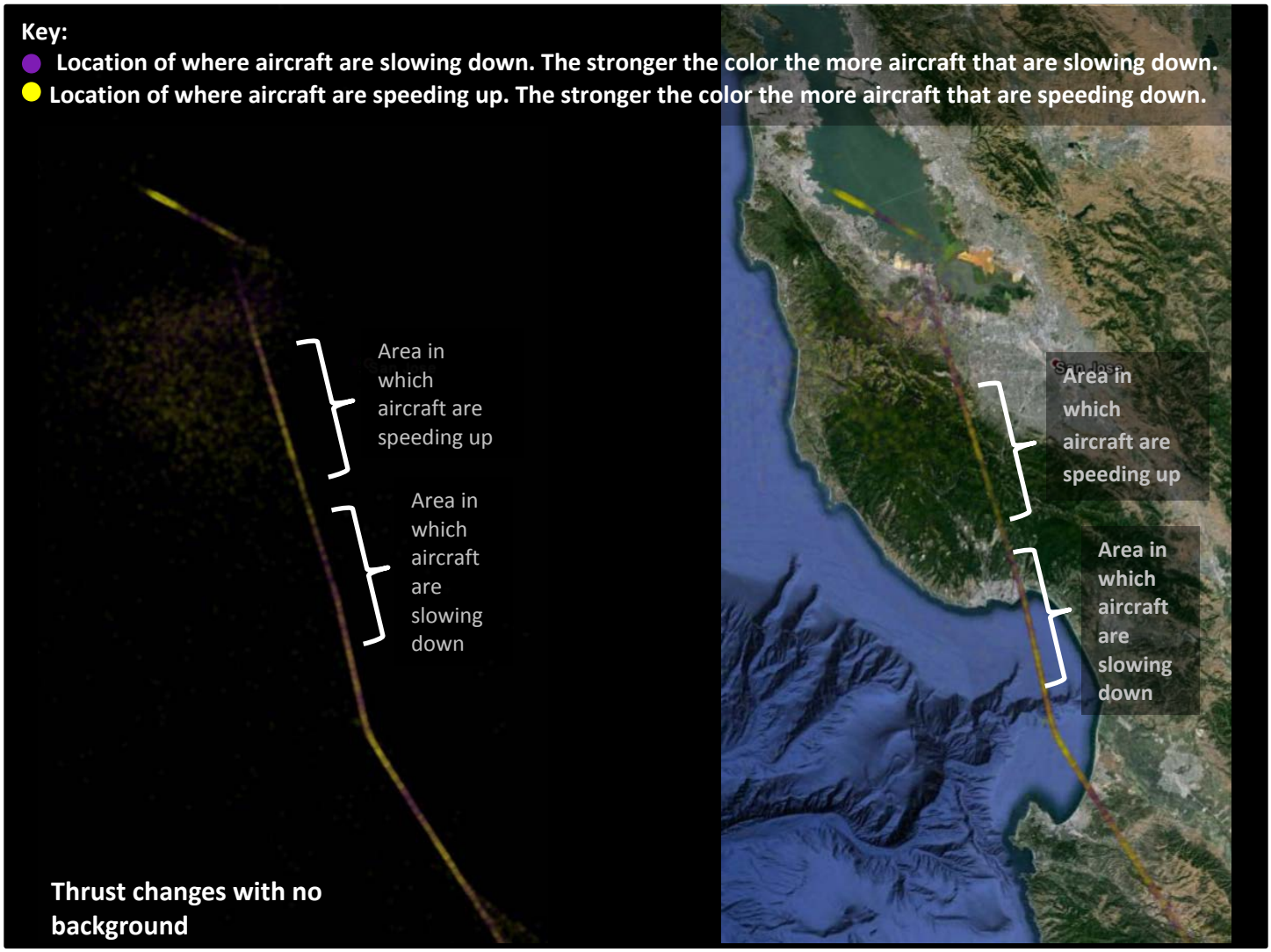


Figure E.3: Visualization of where aircraft on the SERFR arrival have ground speed changes

Estimated IAS and Altitude Characteristics of Aircraft on the SERFR

Figure E.4 below shows the altitude and IAS procedural restrictions for aircraft on the SERFR arrival.

	Procedural restriction	
Waypoint	**Altitude**	**Speed**
SERFR		
NRLLI	At 280K	At or above FL200
WWAVS	At 280K	between 15,000 ft & FL190
EPICK	At 280K	between 10,000-15,000 ft
EDDYY	At 240K	Above 6,000 ft
SWELS		Above 4,700 ft
MENLO	At 230K	At 4,000 ft

Figure E.4 Altitude and IAS procedural restrictions for aircraft on the SERFR arrival.

Figures E.5 and E.6 respectively show the average altitudes and estimated IAS of aircraft on the SERFR arrivals at each of the waypoints. This data indicates that aircraft are on average complying with the restrictions on the procedures. Aircraft may be observed higher than the 4,000 feet MSL restriction at MENLO due to the aircraft that are vectored off and are higher to accommodate the longer path to descend through to the runway.

Aircraft on the SERFR arrival descend through 10,000 feet MSL between the EPICK and EDDY waypoints. While it is difficult to accurately estimate an aircraft IAS based upon its ground speed, it appears that on average most aircraft descend through 10,000 feet at the same time that their estimated IAS drops from 280 to 240 kts.

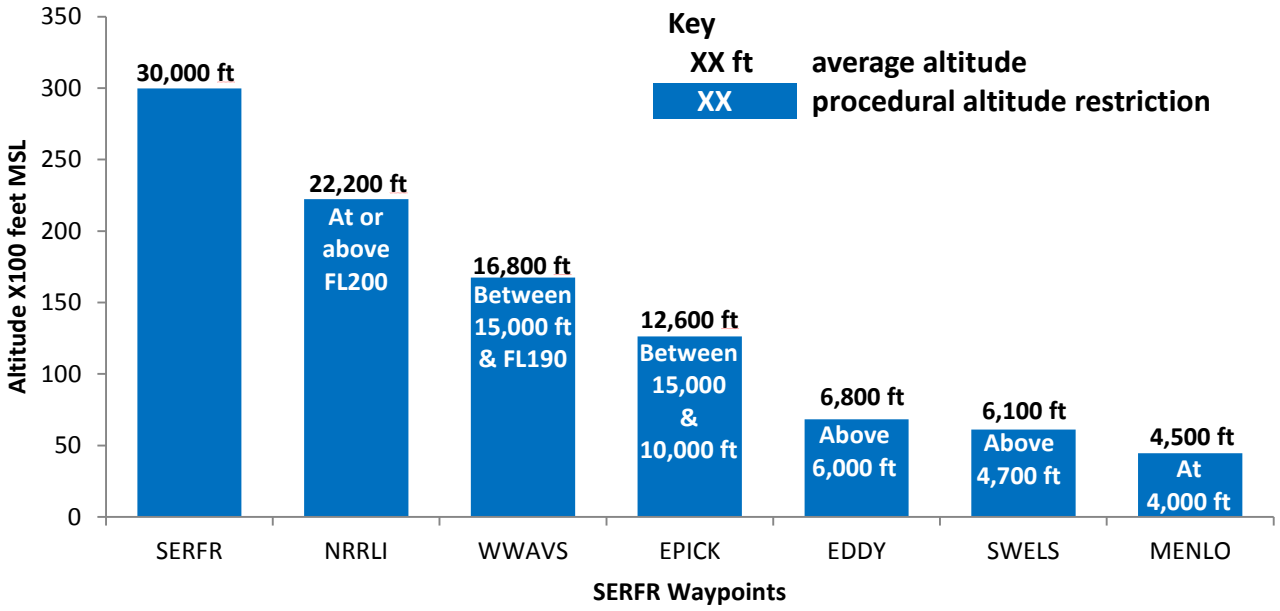


Figure E.5 Altitude characteristics of aircraft on the SERFR arrival.

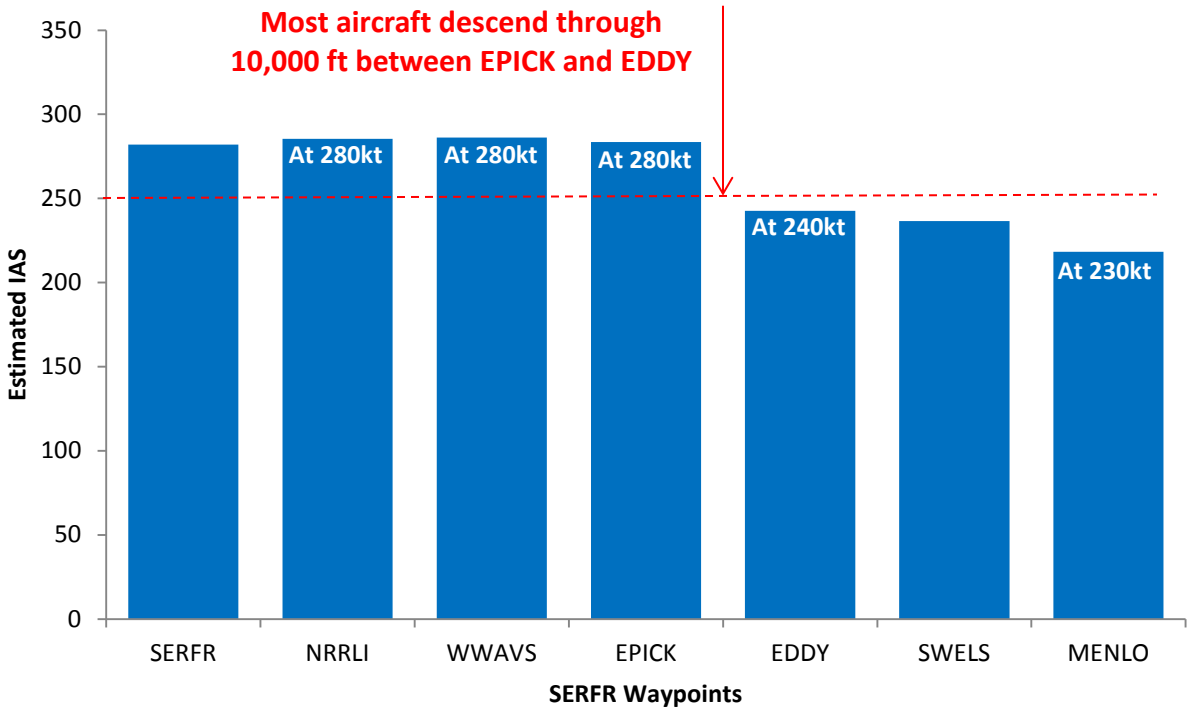


Figure E.6 Estimated IAS characteristics of aircraft on the SERFR arrival.

Cargo Flight Usage of the SERFR Arrival

The cargo flight usage between 10pm – 7am was examined for the BSR in July 2014 and compared to SERFR in July 2015. Comparing July 2014 and July 2015, this examination showed that nighttime cargo arrivals have reduced by approximately 50%. Furthermore all of the 16 nighttime cargo flights on the SERFR arrival occur between 6am – 7am. These nighttime cargo flights represent 2% of the total nighttime SERFR flights.

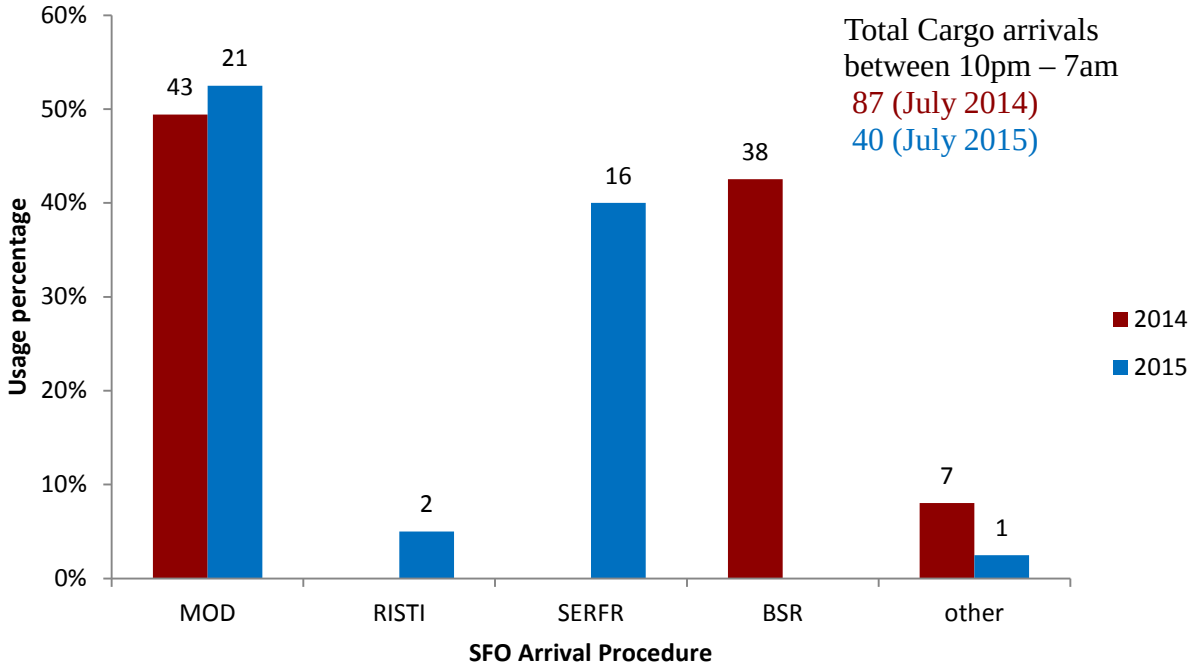


Figure E.7 Cargo arrivals into SFO at night (10pm – 7am).

APPENDIX F

Analysis of Traffic over the Woodside VOR

Flight Activity Over OSI

A comparative analysis of overflights within 1NM of Woodside VOR (OSI) was conducted for July 2014 and July 2015. The results are shown in Figure F.1. These results indicate that the majority of aircraft flying within 1NM of OSI are oceanic arrivals, primarily into SFO. There is also some vectoring activity of SFO arrivals from the north and from the south. Additionally, there is also some activity associated with San Carlos Airport, which is located 7.3 NM to the northeast of OSI.

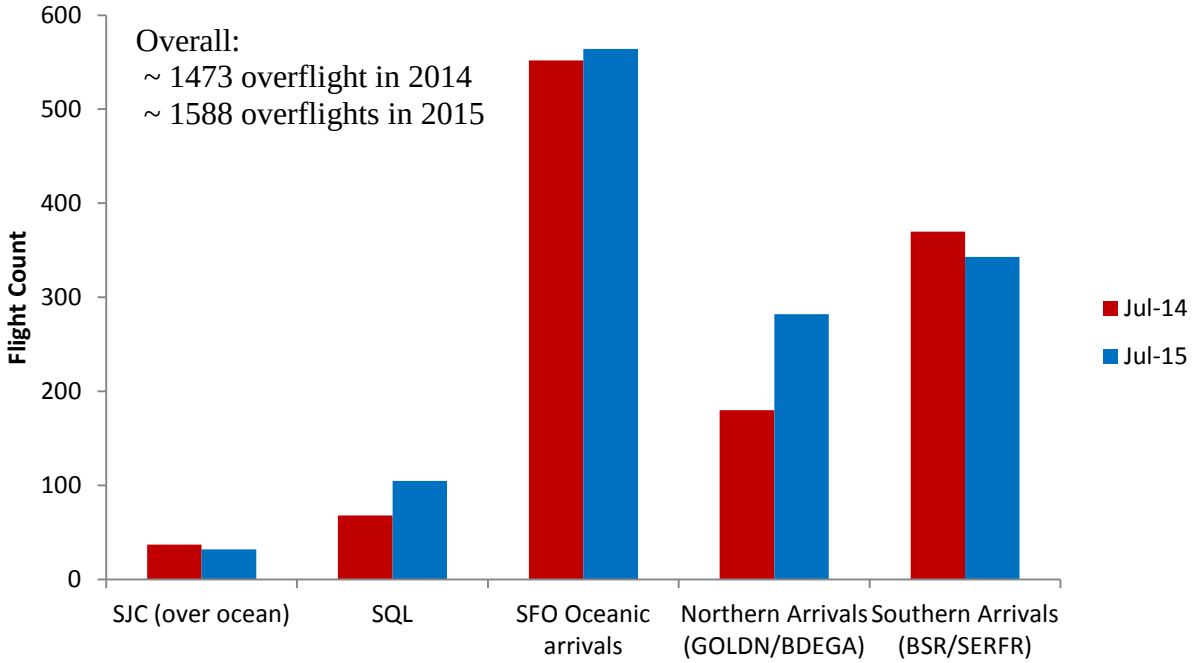


Figure F.1 Comparison of all overflights within 1NM of OSI in July 2014 and July 2015

Oceanic Jet Arrivals Over OSI

According to the NCT Standard Operating Procedures, FAA Order 7110.65E:

Section 5-6 OAK. a.(1): "All oceanic jet arrivals inbound from the west must cross OSI at or above 8,000 feet MSL. Do not descend this traffic below 6,000 feet until east of V25 centerline."

Figure F.2 illustrates the location of OSI with respect to V25.

Figure F.2 Location of OSI, and V25

Figure F.3 below illustrates the altitude distribution of the SFO oceanic jet arrivals over OSI. Due to altimeter errors, the margin of error on the altitude measurements is up to 300 feet. Therefore all flights coming over OSI at or above 7,700 feet were considered compliant with NCT SOP Section 5-6 a.(1).

This data indicates 83% of oceanic arrivals into SFO cross OSI at or above 8,000 feet MSL.
This data also shows a small cluster of aircraft coming over OSI at around 6,000 feet MSL. This cluster of aircraft was compared against the cluster of aircraft crossing OSI around 8,000 feet MSL for any significant differences. Variables looked at for significant differences included time of day, airline, country of origin and equipment type. It was found that country of origin and airline both indicated aircraft crossing OSI at 6,000 feet MLS predominately came from overseas regions (see Figure F.4).

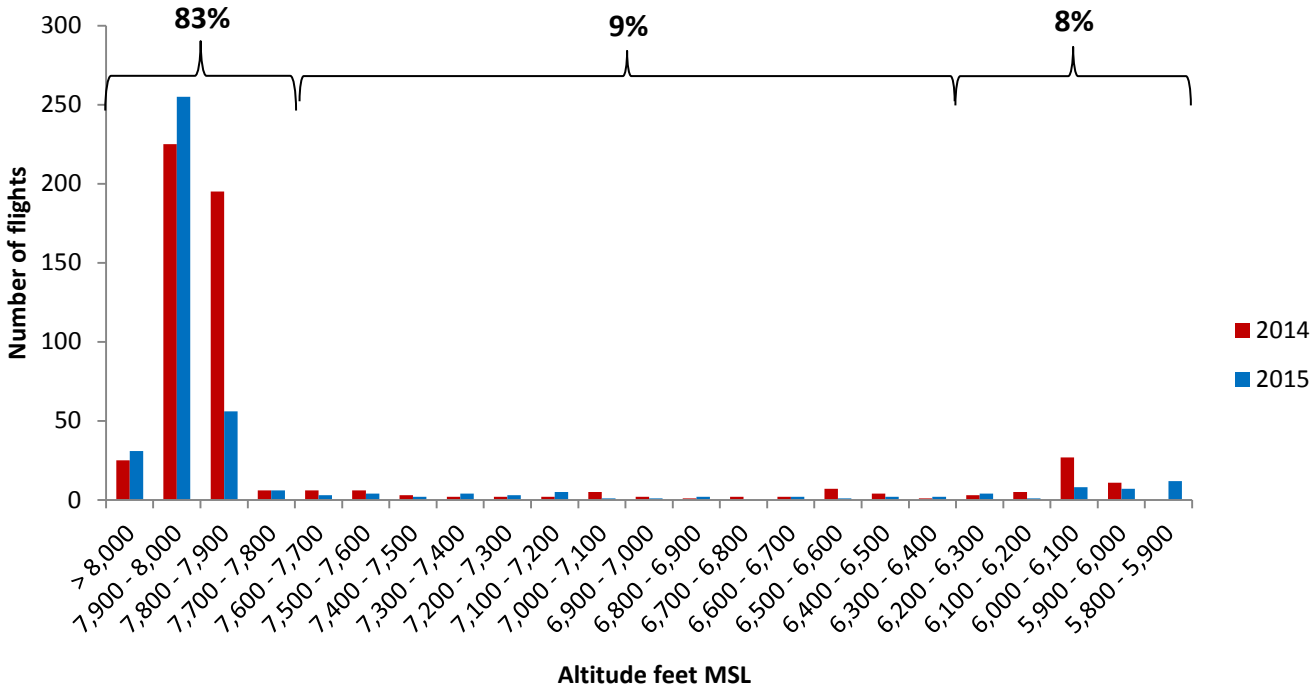


Figure F.3 Altitudes of oceanic SFO arrivals over OSI

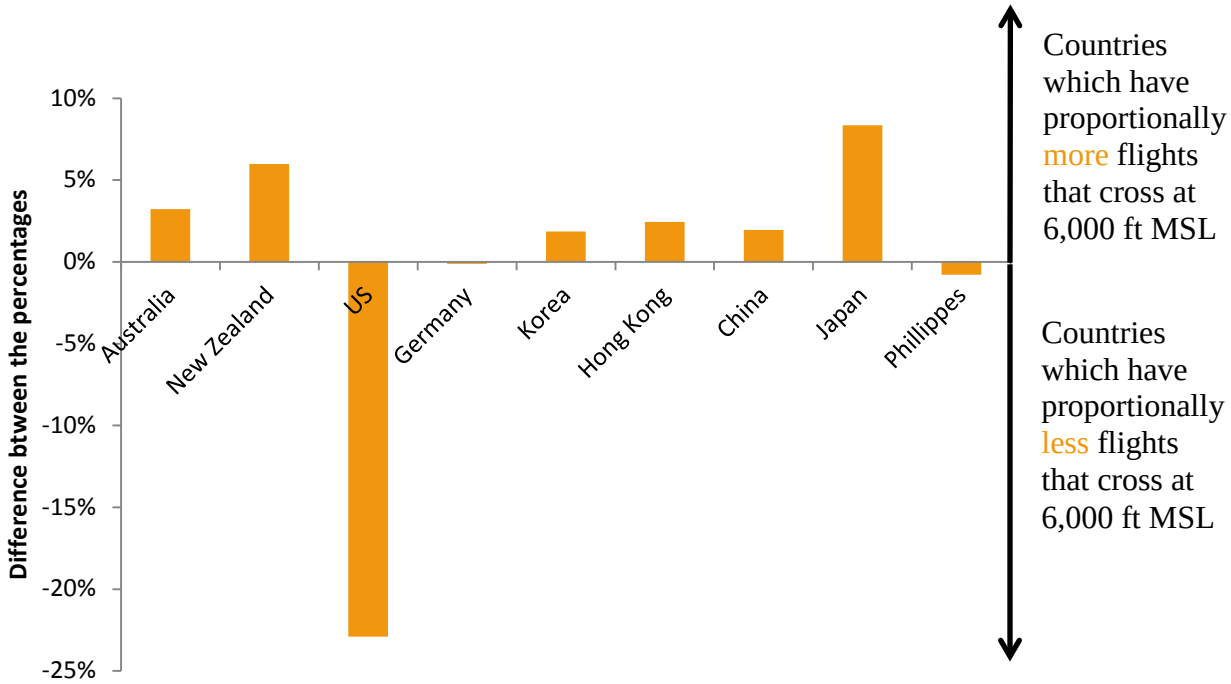


Figure F.4 Difference between the percentage of flights that cross OSI at 8,000 and 6,000 feet MSL by country.

APPENDIX G

SFO Class B Analysis

As illustrated in Figures G.1 and G.2 below, while the BSR was wholly contained within SFO's Class B, the SERFR arrival was not designed to be contained. The reason is that the BSR's steep descent profile cannot be safely accommodated by today's fleet of aircraft. These aircraft would need to utilize speed brakes to stay within Class B, removing the possibility of executing an OPD. The SERFR provides an OPD for the widest range of aircraft that operate into and out of SFO. SFO Class B is in the process of being amended to contain the SERFR.

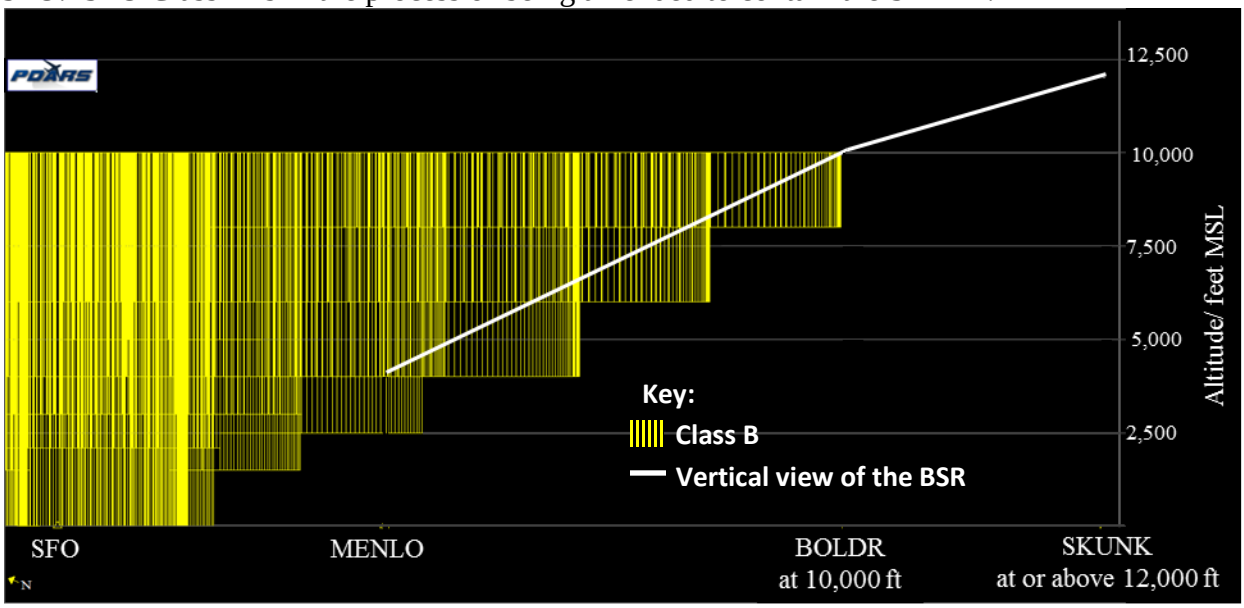


Figure G.1 The interaction of BSR and SFO Class B

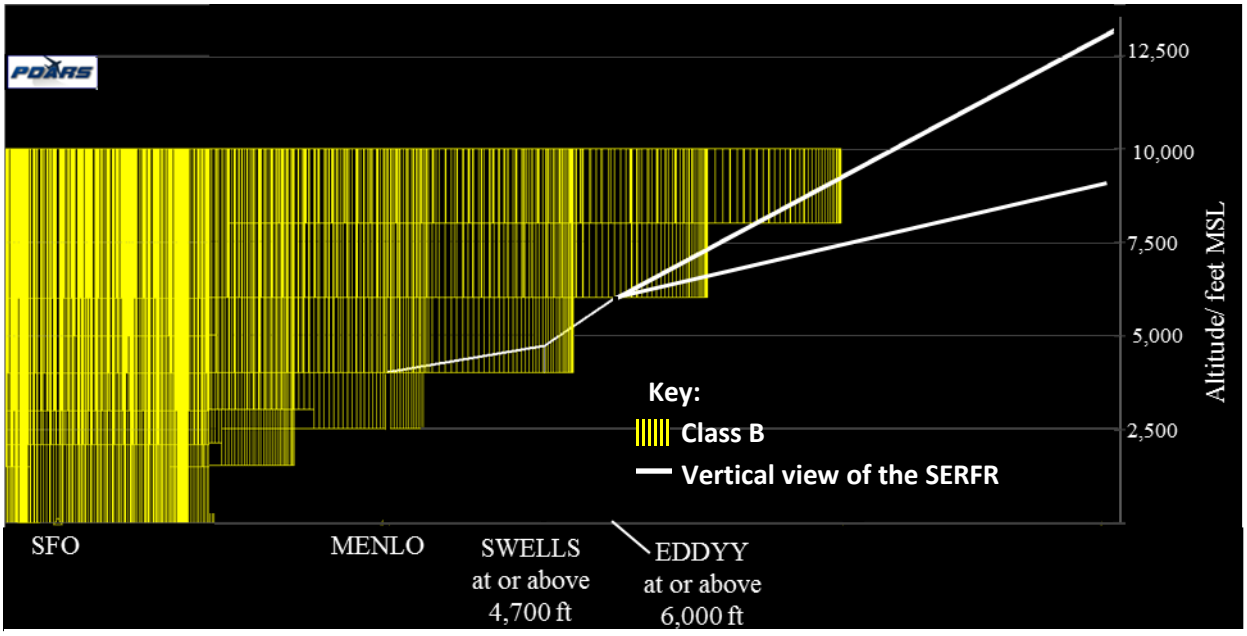


Figure G.2 The interaction of SERFR and SFO Class B

Given this lack of containment, it is not surprising that the number of aircraft leaving and entering (excursions) went up approximately three fold since the implementation of the SERFR arrival. Figure G.3 shows the relative number of Class B excursions in July 2014 and July 2015.

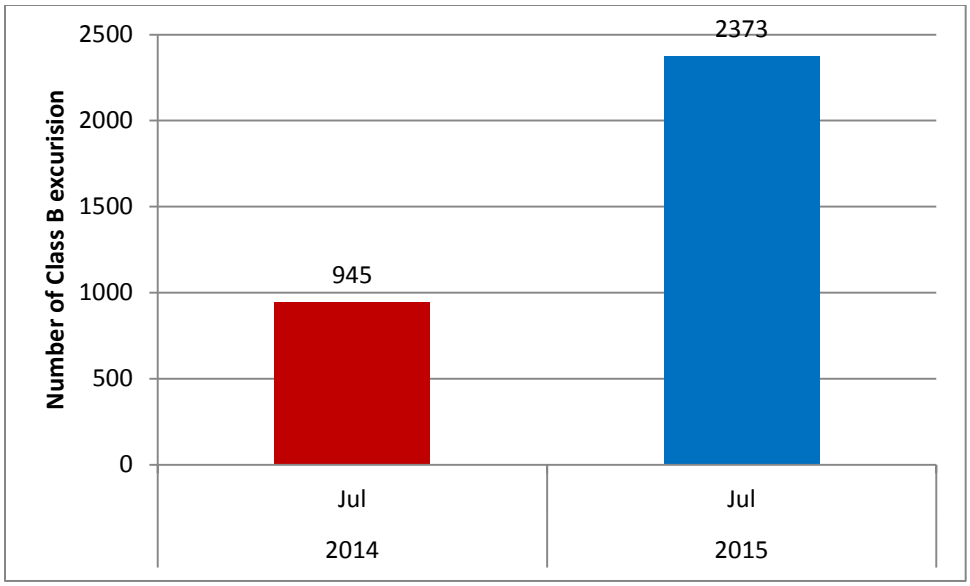


Figure G.3 The number of Class B excursions in July 2014 and July 2015.

APPENDIX H

Optimized Profile Descent Analysis

An analysis was conducted on aircraft leveling off on each of the RNAV arrivals into SFO, OAK and SJC. The intent of this investigation was to ascertain if international and domestic carriers are treated differently. Figure H.1 illustrates the percent usage of international and domestic carriers on each of these arrivals in July 2015. Figure H.2 shows the percentage of international and domestic flights which leveled off on each arrival with respect to the total number of international or domestic flights, respectively, on that arrival.

Figure H.1 Proportion of international and domestic carriers on each of the RNAV arrivals into SFO, SJC and OAK in July 2015.

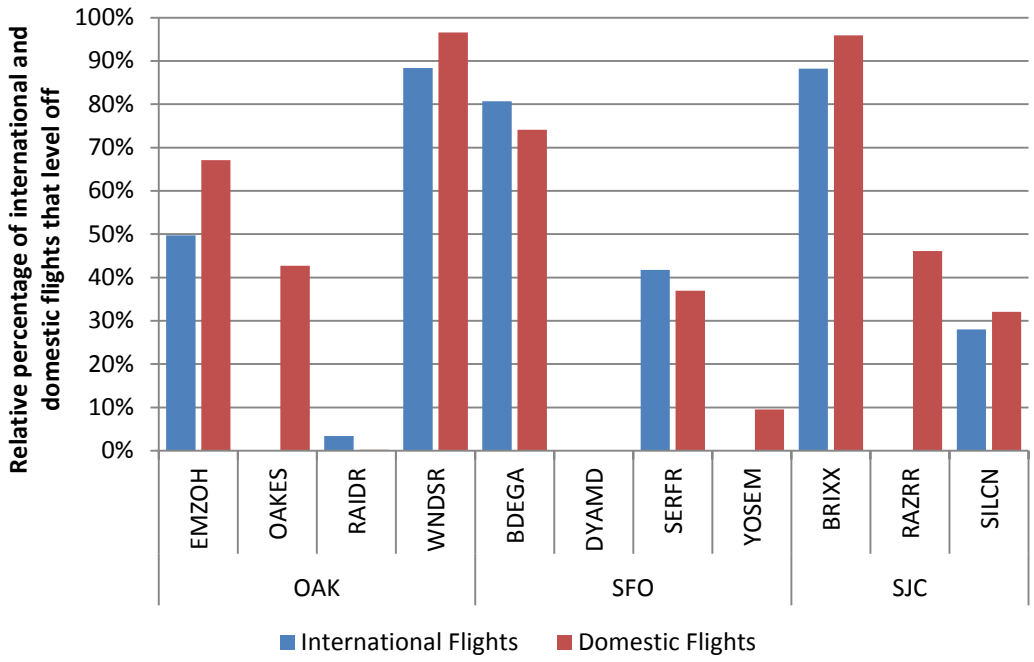


Figure H.2 Relative proportion of international and domestic flights which leveled off during their descent, July 2015.

Based up on the relative percentage of leveling off from each arrival – international flights are treated the same as domestic flights.

APPENDIX I

RTCA Report

RTCA

THE GOLD STANDARD FOR AVIATION SINCE 1935

Approved by the Tactical Operations Committee April 2016

Operator Input to Northern California Noise Initiative Plan

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

April 2016

Operator Input to NorCal Initiative Plan

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- Suggestion: IFP choices 4
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Background and Introduction

Responding to noise mitigation proposals from elected and community representatives in Northern California, the FAA committed to a three-phase study in which it is analyzing a set of proposed actions and determining if they are initially feasible, flyable and operationally acceptable from a safety perspective. The *FAA Initiative to Address Noise Concerns of Santa Cruz/Santa Clara/San Mateo/San Francisco Counties* (NorCal Initiative Plan, see Appendix A) is focused on the Northern California Terminal Radar Approach Control Facility (TRACON), also known as "NorCal."

The NorCal Initiative Plan identifies six specific suggestions in Section 4 (4a through 4f) requiring engagement of aircraft operators. The six issues, as written in the plan, are:

- **Use of speed brakes:** Operators can focus on reducing the use of speed brakes. Pilots have the sole responsibility to determine when speed brakes should be used.
- **Runway choices:** Operators may request more "fly friendly" Runways, especially at night, to reduce noise concerns in certain locations.
- **IFP choices:** Operators can file "fly friendly" procedures, especially at night, to reduce noise concerns in certain locations.
- **Nighttime Offloads/Routes:** Communities want a focus on reducing noise concerns at night.
- **Early Turns:** Operators can assist ATC in ensuring as much as possible of a flight is over water versus over land by not requesting early turns on course.
- **International air carrier execution of Optimized Profile Descents (OPDs):** AJV will reach out to IATA to discuss and get input and perspective on this issue.

The Western Regional Task Group (WRTG) of the Tactical Operations Committee (TOC) was requested to respond to the six issues in Section 4. The task request (see Appendix B) included three components:

- Task 1 – Review the six specific suggestions in Section 4 (4a through 4f) of the attached draft of the NorCal Initiative Plan and provide operator feedback on the impact of these specific suggestions. Feedback may be in the form of neutral, negative or positive feedback.
- Task 2 – Feedback will describe impacts (if any) and rationale.
- Task 3 – Provide any additional ideas/recommendations which might better help address community noise concerns.

While the Tactical Operations Committee was only asked to review six of the potential noise reducing measures under consideration, the FAA continues to assess a number of other possible measures, documented in the NorCal Initiative Plan, more specific to flight procedures. The six items addressed in this report are not independent of these other components of the feasibility study. Additionally, these six items are not necessarily linked to other noise-related efforts being considered in Northern California and/or in the National Airspace System (NAS).

Methodology

The WRTG, which is comprised of individuals with representative experience from airlines, general aviation, labor organizations and others with expertise on operations in the western region of the NAS,

was requested to draft a response to this tasking request. Accordingly, the WTRG conducted "virtual" meetings to discuss the questions posed in the task and draft this report. The full membership of the WRTG is included as Appendix C of this report.

Response to Six Suggestions in NorCal Initiative Plan

The following responses are generated based on the safe and efficient operation of aircraft in a manner that is sensitive to the environmental issues being requested by the FAA.

Suggestion: Use of speed brakes

Operators can focus on reducing the use of speed brakes. Pilots have the sole responsibility to determine when speed brakes should be used.

Response: While pilots prefer to fly an idle descent without using speed brakes, sometimes speed brakes are necessary to ensure the aircraft remains consistent with the Instrument Flight Procedure or ATC clearance. Arriving aircraft following the same procedure may have different vertical profiles due to the type, weight and navigation system of the aircraft, winds and weather conditions, ATC clearances, volume of air traffic, and other factors. At times, these variables can put the aircraft into an undesired energy state (i.e., too high/too fast) that make use of speed brakes necessary. Therefore, speed brakes are only used when operational conditions require.

Suggestion: Runway choices

Operators may request more "fly friendly" Runways, especially at night, to reduce noise concerns in certain locations.

Response: Aircraft operators are sensitive to the need to minimize the impact of noise in certain locations. Runways are assigned by air traffic control for each flight based on the aircraft type, the weather conditions and, to the extent feasible, existing agreements between air traffic control facilities. There may be conditions in which a pilot requests a specific runway based on operational need, such as requiring a longer runway due to aircraft weight. However, runway assignment is typically communicated from air traffic to the pilot making pilot requests for non-standard runways unlikely on a regular basis.

Suggestion: IFP choices

Operators can file "fly friendly" procedures, especially at night, to reduce noise concerns in certain locations.

Response: Aircraft operators file flight plans up to several hours before scheduled departure based on forecasts of multiple factors, including airport configuration (runways in use), aircraft weight, winds, weather and temperature. At the time of departure, air traffic control is responsible to ensure the appropriate Instrument Flight Procedure is assigned to each aircraft based on the aircraft type, destination, operator capabilities and operational conditions. The intent of such IFPs is to ensure a safe and orderly flow of aircraft on departure or arrival. When conditions permit, pilots understand that air traffic may assign a "fly friendly" departure or arrival procedure at night.

Suggestion: Nighttime Offloads/Routes

Communities want a focus on reducing noise concerns at night.

Response: Aircraft operators have a history of working with the FAA and communities to reduce environmental impact and continue to do so. Further study and refinement of the existing Nighttime SFO runway use program may be an opportunity to improve the program's performance for all stakeholders.

Suggestion: Early Turns

Operators can assist ATC in ensuring as much as possible of a flight is over water versus over land by not requesting early turns on course.

Response: When departing, pilots follow either the turns on the FAA's published departure procedure or ATC-provided clearances. Departure procedures (DP) are coded in databases on an aircraft's flight management system (on board computer). When planning and operating the procedure, the pilot selects the DP, briefs it and plans to fly it in its entirety. They execute the procedure unless ATC provides an alternate instruction.

Suggestion: International air carrier execution of Optimized Profile Descents (OPDs)

AJV will reach out to IATA to discuss and get input and perspective on this issue.

Response: IATA is willing to support with coordinating dialogue between a specific international operator's flight technical group and FAA AJV and Flight Standards staff, if there are specific events in which international air carriers executing OPDs deviate from what the FAA expects.

Additional Ideas/Recommendations

The TOC was requested to provide any additional ideas or recommendations that might better help address community noise concerns. Items 2, 3, and 4 of the 6 suggestions the TOC was tasked to address relate to existing SFO Noise Abatement Procedures, which are available at http://www.flysfo.com/community-environment/noise-abatement. The FAR Part 150 process should be considered as the FAA evaluates the appropriate vehicle to develop, assess and implement noise abatement procedures as components of the Noise Compatibility Plan.

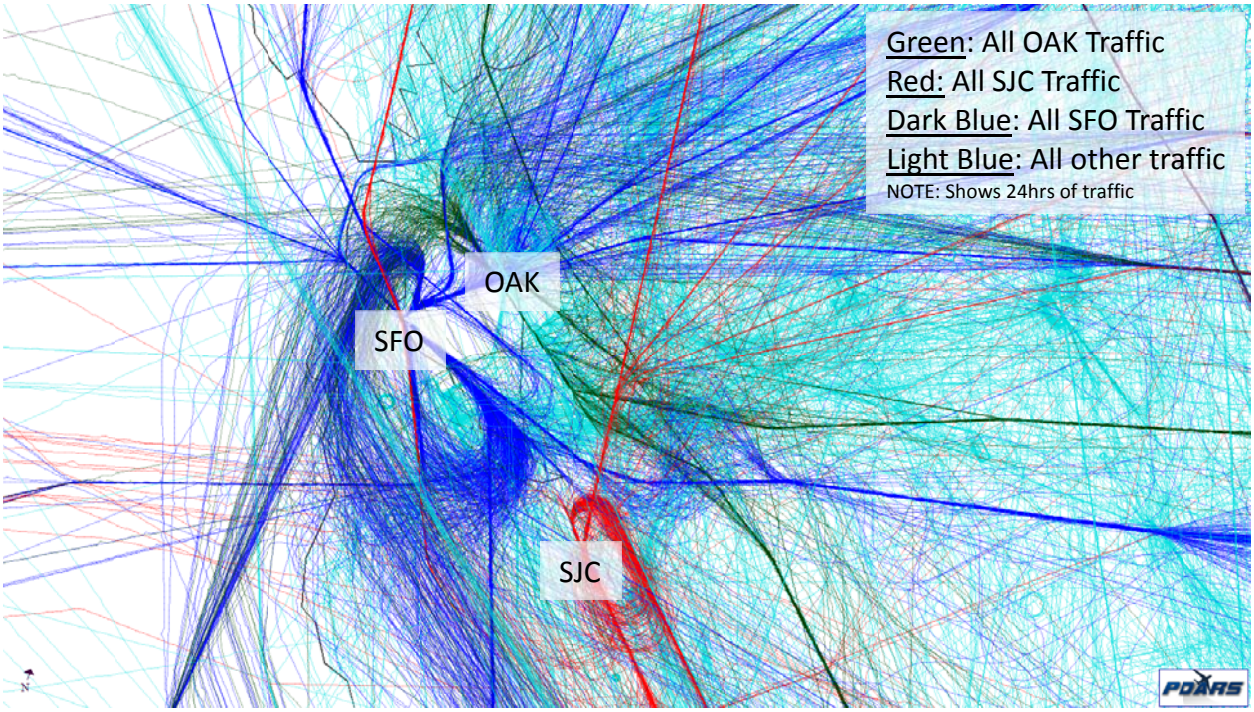
Appendix A: NorCal Initiative Plan

FAA Initiative to Address Noise Concerns of Santa Cruz/Santa Clara/San Mateo/San Francisco Counties

Compiled at the Requests of Representatives Farr, Eshoo and Speier

Executive Summary

Northern California airspace is very complex, with traffic from several major airports, smaller regional airports and military activity. All arrival and departure procedures within the Northern California airspace are interconnected, interdependent and were designed to improve safety and efficiency within the National Airspace System (NAS).



Longstanding issues with, as well as changes to, the Northern California TRACON instrument approach and departure procedures have generated noise concerns from local residents of Santa Cruz, Santa Clara, San Mateo and San Francisco Counties. In meetings and correspondence with congressional offices and local community representatives, the Federal Aviation Administration (FAA) has received recommendations to adjust the current published procedures. In response, the FAA has undertaken the following noise initiative to explore such modifications. Airspace and air traffic procedures are highly dependent upon each other within the NAS and must be evaluated collectively to ensure safety and efficiency.

This initiative will be comprised of three phases. During the first phase, the FAA will conduct a detailed analysis and a preliminary feasibility study focusing on flight procedures criteria and overall fly-ability of the new Performance Based Navigation (PBN) procedures, potential

procedural modifications including speed/altitude adjustments, airspace changes and possibility of moving existing waypoints. An assessment of impacts to operations at the surrounding airports and associated procedures will be completed. In addition, coordination with the local stakeholders will be conducted during this first phase.

During the second phase, FAA will consider any amendments and/or new procedures that are determined to be initially feasible, flyable, and operationally acceptable from a safety point of view. As part of this effort, FAA will conduct the formal environmental and safety reviews, coordinate and seek feedback from existing and/or new community roundtables, members of affected industry, and the National Air Traffic Controllers Association (NATCA) before moving forward with the formal amendment process. During phase three, the FAA will implement procedures; conduct any required airspace changes and additional negotiated actions, as needed.

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"). As such, although not specifically detailed within this noise initiative, the FAA's procedures and standards for evaluating noise impacts associated with all potential modifications to currently published procedures—consistent with FAA Order 1050.1F (effective July 16, 2015)—will be followed and undertaken before implementing any airspace changes. Finally, this document does not constitute either a final decision of the FAA or a re-opening of the FAA's August 6, 2014 final decision for the Northern California (NorCal) Optimization of Airspace and Procedures in the Metroplex (OAPM).

Initiative:

Phase one: Initial Analysis, Feasibility, and Coordination

1. Instrument Flight Procedures/Airspace:

Planned Action: The FAA will conduct a detailed analysis to include preliminary feasibility from a procedures/criteria perspective and fly-ability from an aircraft perspective. Procedures will be analyzed, modeled, and flown in flight simulators. An assessment of the impact to operations and other procedures will be completed. The analysis should indicate whether the potential procedural changes could be made to effectively reduce noise.

a. Altitude adjustments: Raising the floor and/or ceiling of existing procedures may allow the FAA to do the same for other procedures and reduce noise concerns in certain locations.

i. Analyze raising the floor and ceiling of existing SERFR and BRIXX arrivals. (AJV-WOSG)

a) Evaluate raising the altitude at MENLO waypoint to 5,000 feet or establish a new waypoint to allow for crossing the MENLO area closer to 5,000 feet.

ii. Analyze reducing impacts of SSTIK, WESLA, and CNDLE departures. (AJV-WOSG)

Status: Analysis began October 2, 2015

Completion Date: TBD

b. Track adjustments: Where possible, tracks should be adjusted away from areas of concern and moved over water versus land.

i. Analyze moving the SSTIK and PORTE departures more over water. (AJV-WOSG)

ii. Analyze reducing the impacts of SSTIK, WESLA, and CNDLE departures. (AJV-WOSG)

iii. Analyze moving the ILS/Visual Approach to Runway 28L offshore. (AJV-WOSG)

iv. Analyze offsetting Visual Approaches until passing the San Mateo Bridge. (AJV-WOSG)

v. Analyze the impact of non-charted visual approaches to RWY 28 (AJV-WOSG)

NOTE: There are three charted visual approaches to San Francisco (SFO). Two are FAA published approaches, the TIPP TOE VISUAL and the QUIET BRIDGE VISUAL. The third approach is owned by United Airlines and is a special charted visual, also available to other airlines. If changes are made to the procedure, the FAA would request that United Airlines and each airline that uses this procedure update their databases.

Status: Analysis began October 2, 2015

Completion Date: TBD

c. Waypoint Adjustments:

i. On the SERFR arrival, analyze moving EPICK waypoint south to approximately 36 54 52.8N and 121 56 32.7W, add restriction to speed of 280 knots and altitude of 15,000 feet. (AJV-WOSG)

ii. Analyze making adjustments to PORTE departure to maximize offshore routing. (AJV-WOSG)

iii. Evaluate adding a new waypoint roughly over the Highway 17 summit area, between EPICK and EDDYY, with at least a 10,000 feet and 250 knot restriction. (AJV-WOSG)

Status: Analysis began October 2, 2015

Completion Date: TBD

d. Speed Adjustments:

i. Analyze moving speed adjustments over water instead of over land. (AJV-WOSG)

ii. Analyze reducing the speed on the current SERFR arrival. (AJV-WOSG)

iii. Analyze data to determine compliance with the requirement to maintain 250 knots or less below 10,000 feet Mean Sea Level (MSL). (AJV-WOSG)

Status: Analysis began October 2, 2015

Completion Date: TBD

e. Holding Patterns

i. On the SERFR arrival, study current use of the holding pattern at EPICK and the possibility of moving the holding pattern to WWAVS. (AJV-WOSG)

Status: Analysis began October 2, 2015

Completion Date: TBD

f. PBN Procedures:

i. Evaluate proposed PBN arrival procedures from local community groups for feasibility, fly-ability and safety concerns. (AJV-WOSG)

ii. Evaluate the effect of dispersing flight tracks over a wider range. (AJV-WOSG)

iii. Study the feasibility of creating new transitions for the NIITE departure for airports to southbound destinations. (AJV-WOSG)

iv. Study the possibility of new SFO RNP approaches that will serve Runways 28 L/R that follow the Big Sur ground track, curved out over the Bay crossing MENLO at 5000-6000 feet. (AJV-WOSG)

Status: Analysis began October 2, 2015

Completion Date: TBD

2. Air Traffic Control:

Planned Action: The Western Service Center, on behalf of the Air Traffic Director of Operations, will work with the facilities to assess what opportunities exist to modify operations. Part of this assessment will include looking at the possibility of adjustments during reduced volume night operations, even if day operations cannot be changed. If changes can be made there will need to be a safety assessment, controller training, pilot briefings, and the SFO community roundtable may need to be engaged.

a. **Sequencing and Vector Points:** There may be actions air traffic controllers can take to reduce noise concerns such as assessing whether changes can be made to vectoring aircraft over water more.

   i. Analyze adjusting air traffic activity in the vicinity of Woodside VOR including altitudes. (AJT, AJV-WOSG)

   ii. Analyze adjusting air traffic to eliminate early turns over land. (AJT, AJV-WOSG)

      a) Focus on leaving aircraft over water as long feasible.

      b) Keep aircraft on the SSTIK departure until the SSTIK waypoint before turning.

      c) Keep aircraft on the NIITE departure to at least the NIITE Waypoint as much as possible.

   Completion Date: TBD

b. **Use of Descend Via:**

   i. Increase use of descend via procedures. (AJT, AJV-WOSG)

   ii. Increase use of descend via procedures for international flights. (AJT, AJV-WOSG)

   Completion Date: TBD

c. **Class B Containment:** Some current procedures, as designed, are not fully contained within the existing SFO Class B airspace.

   i. Analyze current versus historic data to determine trends and risks to aircraft exiting and reentering Class B airspace. (AJT, AJI, AJV-WOSG)

   ii. Analyze current RNAV arrival and departure procedures to determine necessity and feasibility of redesign. (AJT, AJI, AJV-WOSG)

   iii. Analyze current RNAV arrival and departure procedures to determine necessity and feasibility of redesigning Class B airspace. (AJI, AJV-WOSG)

   Status: Ongoing

   Completion Date: TBD

d. Speed Brakes:

i. Study the potential reduction and/or elimination of the use of speed brakes and conduct a track analysis to determine flight characteristics, utilizing the Aviation Safety Information Analysis and Sharing (ASIAS) database. (MITRE CAASD)

ii. Work with stakeholders to determine feasibility of reducing the use of speed brakes and other surface controls over land.

Status: Ongoing

Completion Date: TBD

e. Runway Usage:

i. Study the feasibility of increasing the use of Runway 10. (AJT)

ii. Study the feasibility of increasing the use of RWY 01 for Departures (AJT). Study the feasibility of proceduralizing the 050 departure heading off RWY 01 at night. (AJT)

iii. Study the necessity of extending nighttime operations at SFO. According to the SFO Standard Operating Procedure, the preferred Runway for operations between 0100 and 0600 local time is departing Runway 10 and landing Runway 28. (AJT)

iv. When weather conditions permit, study the increase in use of the Shoreline 7 Departure off RWY 28R or 28L. (AJT, AJV-WOSG)

Completion Date: TBD

f. Instrument Flight Procedures (IFP):

i. Study the feasibility of creating new transitions for the NIITE departure for airports to southbound destinations. (AJV-WOSG)

ii. When weather operations permit, study the use of the Shoreline7 departure off of Runway 28R or 28L. (AJT, AJV-WOSG)

iii. Study the use of offset visual approaches in lieu of straight in visual approaches. (AJT, AJV-WOSG)

iv. Study the usage of GAP departure. (AJT, AJV-WOSG)

v. Study whether international and domestic aircraft are handled the same by Air Traffic Control (ATC). (AJT, AJV-WOSG)

vi. Study the feasibility of increasing the use of the SSTIK departure during the day and the NIITE departure at night. (AJT, AJV-WOSG)

Completion Date: TBD

g. Opposite Direction Operations (ODO): Operational changes related to ODO may have increased noise concerns at night in certain locations.

i. Review recent implementation of ODO procedures and their impacts in the San Francisco Bay area. (AJT, AJI)

ii. Assess potential options for night operations. (AJT, AJI)

Completion Date: TBD

3. Traffic Management

Planned Action: The Western Deputy Director of System Operations, on behalf of the Air Traffic Director of Operations, will work with the Western Service Center and local facilities to evaluate the actions and suggestions below. During the analysis, the focus will be on use of traffic management tools and initiative to ensure current practices are as effective and efficient as possible for the potential reduction of noise concerns.

a. Equitability: Concentration of noise should be reviewed, especially during nighttime operations.

i. Review the current nighttime operations to determine if they adequately address preferential Runway usage. (AJT, AJV-WOSG)

NOTE: According to the SFO Standard Operating Procedure, the preferred Runway for operations between 0100 and 0600 local time is departing Runway 10 and landing Runway 28.

ii. Evaluate the effect of dispersing flight tracks over a wider range or developing multiple parallel RNAV procedures. (AJT, AJV-WOSG)

Completion Date: TBD

b. Interactions and agreements: Facility agreements between Northern California TRACON (NCT), Oakland Air Route Traffic Control Center (ARTCC) (ZOA), and Los Angeles ARTCC (ZLA) might be amended to reduce the need for off-course vectors and speed adjustments to potentially reduce noise concerns in certain locations.

i. Review facility agreements for possible changes to aircraft set up and sequencing. (AJT, AJV-WOSG)

ii. Review facility agreements to ensure they are effective and efficient with regard to routing and speeds. (AJT, AJV-WOSG)

Completion Date: TBD

c. Time Based Flow Management (TBFM): The use of TBFM to enhance sequencing may reduce the need for off course vectors and speed adjustments and may reduce noise concerns in certain locations.

i. Review the current and projected status of using TBFM procedures. (AJT, AJV, AJR)

ii. Review the impact of using TBFM on current noise issues. (AJT, AJV, AJR)

Completion Date: TBD

d. Nighttime Offloads/Routes: Communities want a focus on reducing noise concerns at night.

i. Review nighttime operations. (AJT)

ii. Review cargo flight operations to determine if previous actions have adequately addressed all issues. (AJT)

iii. Review utilizing the current Big Sur for late night cargo arrivals. (AJT, AJV-WOSG)

iv. Review the current nighttime operations to determine if they adequately address preferential Runway usage. (AJT, AJV-WOSG)

NOTE: According to the SFO Standard Operating Procedure, the preferred Runway for operations between 0100 and 0600 local time is departing Runway 10 and landing Runway 28.

Completion Date: TBD

4. Operators:

Planned Actions: AJV will engage Airlines for America (A4A) and The International Air Transport Association (IATA) nationally to solicit perspective and input into defined issues. Operator involvement needs to be discussed, especially if the FAA does not utilize the roundtable concept to work issues with stakeholders. It is assumed that the

Office of the Associate Administrator for Airports (ARP) would want some level of input or engagement as SFO should also be involved directly in these conversations.

a. **Use of speed brakes:** Operators can focus on reducing the use of speed brakes. Pilots have the sole responsibility to determine when speed brakes should be used. (A4A, IATA)

   Completion Date: TBD

b. **Runway choices:** Operators may request more "fly friendly" Runways, especially at night, to reduce noise concerns in certain locations. (A4A, IATA, SFO)

   Completion Date: TBD

c. **IFP choices:** Operators can file "fly friendly" procedures, especially at night, to reduce noise concerns in certain locations. (A4A, IATA, SFO)

   Completion Date: TBD

d. **Nighttime Offloads/Routes:** Communities want a focus on reducing noise concerns at night. (A4A, IATA, SFO)

   Completion Date: TBD

e. **Early Turns:** Operators can assist ATC in ensuring as much as possible of a flight is over water versus over land by not requesting early turns on course. (A4A, IATA)

   Completion Date: TBD

f. **International air carrier execution of Optimized Profile Descents (OPDs):** AJV will reach out to IATA to discuss and get input and perspective on this issue. (IATA)

   Completion Date: TBD

5. Community Engagement

a. **Community Forums:** Addressing noise concerns in a densely populated and operationally complex area like Northern California is best done in a forum (such as existing and/or new roundtables) that includes community leaders and is supported by the FAA and Bay Area Airports. (AWP, AGI)

b. **San Carlos Airport:** Apart from the efforts described in this report, there are TBD conversations with communities around the airport that are concerned about the increase in flights and noise. (AWP)

Phase two: Modifications and Review

Based on the outcome of the initial analysis, feasibility and coordination, modifications may be made to the proposed procedures and/or airspace or operating procedures using the guidance found in current FAA Orders, directives and labor agreements which includes conducting the Environmental Review; Safety Risk Management (SRM); and appropriate public outreach.

Completion Date: TBD

Phase three: Implementation

Based on the outcome of the modifications and review phase and assuming the proposed procedure(s) meet the purpose and need, as well as all applicable environmental laws and requirements, the controller workforce and operators will be trained/briefed on any operational or procedural changes before publication and operational use.

Completion Date: TBD

Appendix B: FAA Tasking Letter

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

MAR 8 2016

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

Dear Ms. Jenny:

The FAA has made great progress in reducing the number of people around airports that are exposed to significant aircraft noise. Nevertheless, there is an increasing level of public debate, political interest, and litigation related to aircraft noise. Public expectations with respect to noise exposure are changing. While noise levels might be the same or less due to quieter aircraft, the simple volume and concentration of flights over communities (particularly related to NextGen implementation) seems to be shaping perceptions. Dialogue with congressional and community representatives has highlighted a need to review engagement processes and associated guidance materials.

The FAA has initiated several efforts in response to noise concerns. We are developing a Community Involvement Plan for performance based navigation (PBN) to proactively identify and address community concerns during PBN projects and before PBN flight procedures are finalized. The plan also addresses more effective communication of the purpose and potential impacts of PBN projects. Improvements in how outreach is conducted for procedure changes include: early outreach to airport authorities for help in identifying local environmental sensitivities; improved responses and documentation of communication with external individuals and groups; and greater executive-level, in addition to staff-level, interaction when initiating outreach to airport authorities.

Several months ago, the FAA received several detailed, technical suggestions from organized public noise groups involving procedural and/or operational changes proposed to address community noise concerns in Northern California principally associated with operations in and out of San Francisco International Airport (SFO). The FAA was given this information through various political representatives who have continued to engage on behalf of their constituents in the SFO area. The focus of the proposals was in Santa Cruz, Santa Clara, San Mateo, and San Francisco counties. FAA committed to analyze the proposed actions and determine if they are initially feasible, flyable, and operationally acceptable from a safety perspective. The FAA will complete Phase 1 of this initiative and has committed to briefing its findings at the end of March. Phase 2 will likely utilize the PBN Order to do the formal development activities for those procedure proposals determined as feasible in Phase 1. Phase 3 will be the implementation of the procedures from Phase 2 above, as well as the

implementation of other feasible non-procedural proposals. FAA intends to work Phases 2 and 3 with the airport, communities and operators through the SFO Roundtable.

The FAA requests that the TOC Western Regional Task Group (WRTG) perform the following tasks:

Task 1 – Review the six specific suggestions in Section 4 (4a through 4f) of the attached draft of the NorCal Initiative Plan and provide operator feedback on the impact of these specific suggestions. Feedback may be in the form of neutral, negative or positive feedback.

Task 2 – Feedback will describe impacts (if any) and rationale.

Task 3 – Provide any additional ideas/recommendations which might better help address community noise concerns.

Completion of these tasks will provide the FAA with help to inform better decision making moving forward. The FAA will provide subject matter experts as needed to support these tasks.

FAA would like the information/recommendations noted above by March 29, 2016.

Sincerely,

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

Appendix C: Members of the Western Regional Task Group

Rune Duke, Aircraft Owners and Pilots Association
Melissa McCaffrey, Aircraft Owners and Pilots Association
Lynae Craig, Alaska Airlines
Toby Miller, American Airlines, Inc.
Michael O'Brien, American Airlines, Inc.
Brian Townsend, American Airlines, Inc.
Tim Stull, American Airlines, Inc.
Mark Hopkins, Delta Air Lines, Inc.
David Vogt, Delta Air Lines, Inc.
L.A. "Jake" Bailey, Federal Aviation Administration
Joe Bert, Federal Aviation Administration
DeAnna Bridenback, Federal Aviation Administration
Tom Cawley, Federal Aviation Administration
Kenneth Fox, Federal Aviation Administration
Lenore Marentette, Federal Aviation Administration
David Meeker, Federal Aviation Administration
William Ruggiero, Federal Aviation Administration
Kim Stover, Federal Aviation Administration
Warren Strickland, Federal Aviation Administration
James Taylor, Federal Aviation Administration
Adam Thorstensen, Federal Aviation Administration
Maclovia Varner, Federal Aviation Administration
Glen Wilhelm, Federal Aviation Administration
Dan Allen, FedEx Express (Chair)
Phil Santos, FedEx Express
Kevin McKennon, Horizon Air
Jeffrey Miller, International Air Transport Association
Bill Murphy, International Air Transport Association
John Martin, JetBlue Airways
Sandra Park, Mesa Airlines
Mark Prestrude, National Air Traffic Controllers Association
Trin Mitra, RTCA, Inc.
Allan Lisonbee, SkyWest Airlines
Perry Clausen, Southwest Airlines
Kevin Coon, United Airlines, Inc.
Bill Cranor, United Airlines, Inc.
George Ingram, United Airlines, Inc.
Glenn Morse, United Airlines, Inc.
Jim Hamilton, United Parcel Service
Jay Warren, Virgin America