FAA Northern California Initiative Feasibility Study: Feasible Solution Areas

As provided by the Federal Aviation Administration May 16, 2016; and reformatted by the Office of Santa Clara County Supervisor Joe Simitian, July 15, 2016.

TABLE OF CONTENTS

Solution Area 1:

SFO Class B Amendment

RESPONSE TABLES

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.

Adjustment Type	d. Speed
Adjustment Detail	i. Analyze moving speed adjustments over water instead of over land ii. Analyze reducing the speed on the current SERFR arrival.

Evaluation	• About 50% of flights on the SERFR fly the entire route as published.
	  • SERFR was designed as an OPD, where the aircraft maintain an idle descent from prior to EPICK to MENLO.
	  • Due to the lack of containment in the SFO Class B, ATC has been instructing aircraft to, "… descend via SERFR One except after EPICK maintain 8,000…"
	  • While this may keep the aircraft within the Class B, the OPD benefit of the STAR is diminished.
	  • If aircraft descend to a level altitude, speed brakes may be used for energy management.
	  • The SFO Class B is currently in the process of being amended to fully contain the SERFR STAR.
	  • Once this amendment is completed, the flights that fly the entire SERFR STAR could use the idle descent as intended through EPICK, which may alleviate some of the noise from speed adjustments in this area.
	• The other 50% of aircraft on SERFR are vectored off in order to sequence aircraft with other arrivals into SFO.
	  • A similar percentage of aircraft were historically vectored off the Big Sur (BSR) arrival. This operational requirement is not expected to change without increased ground delays at the departure airport.

Supporting Analysis	See Appendix E
Feasibility Assessment	Feasible
Next Steps	FAA is pursuing an amendment of the SFO Class B to contain all procedures, which is expected to improve the noise impacts associated with speed adjustments near the EPICK waypoint.

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, , facility automation changes implemented, and the SFO community roundtable may need to be engaged.

Adjustment Type	b. Use of Descend Via
Adjustment Detail	i. Increase use of descend via procedures.
Evaluation	• The NorCal Metroplex was tasked with maximizing the use of OPDs ("descend via" procedures) and maximizing the efficiency of the airspace. • Given NorCal airspace demand and the desire to avoid increasing ground delays, it was understood not all arrival traffic would be able to stay on their respective procedure. • The NorCal Metroplex recognized this by designing the procedures so that the busiest routes were the most optimized. • In particular the SERFR STAR was optimized above other STARs – for example the BEDGA STAR was designed with level-offs in order to maintain separation with the SERFR STAR • Additionally, current Class B constraints do not allow for aircraft on the SERFR arrival to fly the OPD as published. Rather, ATC instruct aircraft to level off after EPICK to ensure they remain within the Class B before continuing their descent.
Supporting Analysis	Not applicable
Feasibility Assessment	Feasible
Next Steps	FAA is pursuing an amendment of the SFO Class B to contain all procedures, which would potentially allow as many aircraft as possible to utilize the OPD STAR.

Adjustment Type	c. Class B Containment
Adjustment Detail	iii. Analyze current RNAV arrival and departure procedures to determine necessity and feasibility of redesigning Class B airspace.
Evaluation	The SFO Class B is being redesigned to include all SFO procedures.
Supporting Analysis	Not applicable
Feasibility Assessment	Feasible
Next Steps	FAA is pursuing an amendment of the SFO Class B to contain all procedures

Adjustment Type	d. Speed Brakes
Adjustment Detail	ii. Work with stakeholders to determine feasibility of reducing the use of speed brakes and other surface controls over land.
Evaluation	• According to stakeholders, speed brakes are a last choice in energy dissipation on an aircraft. • Aircraft that are vectored off the SERFR STAR, are commonly assigned an altitude and a speed which often results in use of speed brakes to comply.
Supporting Analysis	See Appendix E
Feasibility Assessment	Feasible
Next Steps	FAA is pursuing an amendment of the SFO Class B to contain all procedures

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.

Adjustment Type	d. Nighttime Offloads/Routes
Adjustment Detail	ii. Review cargo flight operations to determine if previous actions have adequately addressed all issues.
Evaluation	• It was found that very few cargo flights occur at night. • Cargo flights account for 2% of night time (10pm – 7 am) SERFR flights.
Supporting Analysis	See Appendix E
Feasibility Analysis	Feasible
Next Steps	FAA will provide current analysis of the proposed changes, as summarized in Part 3.d.i, to the Select Committee for discussion and determination, noting that changes in where aircraft are typically vectored off procedures would result in a shift of traffic, and subsequently noise, over residential areas. If approved by the Select Committee, then the proponent will submit the PBN procedure proposals into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

Solution Area 2:

Transition the SERFR STAR Back to the BSR Ground Track Prior to EPICK

RESPONSE TABLES

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.

Adjustment Type	f. PBN Procedures
Adjustment Detail	i. Evaluate proposed PBN arrival procedures from local community groups for feasibility, fly-ability and safety concerns.

Evaluation	• A suggestion was to transition aircraft on the SERFR back to the BSR, prior to EPICK.
	  • Three waypoints were suggested on the BSR, one where aircraft join, and another two downstream. At all three new waypoints, altitude restrictions were suggested.
	  • This is possible, although having hard altitudes at the suggested waypoints on the BSR would remove the possibility of implementing an OPD.
	  • Adjusting one procedure potentially causes a domino effect. Therefore, before an adjustment is undertaken, a thorough investigation is necessary to evaluate any potential gains and losses resulting from the necessary adjustment of other procedures.
	• It was instead suggested that these altitudes be adjusted in order to allow for OPD.

Supporting Analysis	See Appendix D
Feasibility Assessment	Feasible
Next Steps	FAA will forward this proposal go to the Select Committee so that the communities under the BSR and SERFR can be in agreement regarding any potential movement.

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.

Adjustment Type	d. Nighttime Offloads/Routes
Adjustment Detail	ii. Review cargo flight operations to determine if previous actions have adequately addressed all issues.
Evaluation	• It was found that very few cargo flights occur at night. • Cargo flights account for 2% of night time (10pm – 7 am) SERFR flights.
Supporting Analysis	See Appendix E
Feasibility Analysis	Feasible
Next Steps	FAA will provide current analysis of the proposed changes, as summarized in Part 3.d.i, to the Select Committee for discussion and determination, noting that changes in where aircraft are typically vectored off procedures would result in a shift of traffic, and subsequently noise, over residential areas. If approved by the Select Committee, then the proponent will submit the PBN procedure proposals into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

Solution Area 3:

Increasing Percentage of NIITE Flights Which Remain on NIITE Until at Least the NIITE Waypoint

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, , facility automation changes implemented, and the SFO community roundtable may need to be engaged.

Adjustment Type	a. Sequencing and Vector Points
Adjustment Detail	ii. Analyze adjusting air traffic to eliminate early turns over land. a) Focus on leaving aircraft over water as long feasible.
Evaluation	• The current interplay of departures and arrivals for SFO, SJC and OAK was extensively studied during the NorCal Metroplex. • As part of this process, moving procedures more over water was considered. Given the demand on the airspace is generally more than the procedures alone can accommodate. Procedures which allow aircraft the shortest route in or out of the NorCal Airspace were chosen to prevent extensive ground delays. • When demand lessens (for example during 1am – 6am) ATC has more flexibility to place aircraft on procedures which take aircraft on a longer path out or into the NorCal Airspace and over less noise-sensitive areas, without compromising safety or increasing ground delays. This is why the NIITE, HUSSH, FOGGG and the GNNRR departures were designed and implemented. During the period from 1am – 6am, these departures are used 88% of the time. • To accommodate the arrival and departure demands, ATC often needs to vector aircraft off procedures. While it is not feasible to re-design the procedures to allow aircraft to stay over water, it may be possible to change the point where aircraft are vectored off the procedure, without increasing ground delays. • Analysis indicates that aircraft are typically vectored off the NIITE and CNDEL procedures before reaching the NIITE and CNDEL waypoints respectively, minimizing how long these flights stay over water.
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	FAA will provide analysis of the proposed changes to the Select Committee for discussion and determination, noting that when aircraft are vectored off procedures a shift of traffic, and subsequently noise, can occur over residential areas.

Adjustment Type	a. Sequencing and Vector Points
Adjustment Detail	ii. Analyze adjusting air traffic to eliminate early turns over land. c) Keep aircraft on the NIITE departure to at least the NIITE Waypoint as much as possible.

Evaluation	• Traffic permitting, night time procedures, such as the NIITE departure are switched on between the hours of 10pm – 7am. 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.
	  • The same percentage of SFO daily departures (9%) occur between 10 pm - 12 am, as do between 12 am – 6 am.
	  • During 10 pm -12 am, although the NIITE departure is commonly used, it is not used as designed given the higher demand of the airspace.
	• Analysis indicated that 27% of SFO departures on the NIITE departure are vectored off the procedure prior to the NIITE waypoint.
	  • Approximately a quarter of these vectored flights occur when the airspace demand is low between the hours of 12am – 6am.
	  • During this time, it is feasible that ATC increase the percentage of NIITE departures which remain on the procedure until at least the NIITE waypoint.

Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	FAA will provide guidance to ATC facilities to develop guidance that emphasizes leaving aircraft on the noise abatement procedure until NIITE; traffic permitting.

Adjustment Type	g. Opposite Direction Operations (ODO)
Adjustment Detail	ii. Assess potential options for night operations.
Evaluation	There is one feasible possibility for a night time south departure: • Create a south transition on the NIITE departure (from RWY 28/01) The 050 heading is already proceduralized through the NCT SOP and is already used as much as possible at night.
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	The FAA will forward the NIITE south transition proposal to the Select Committee for discussion. If approved by the Select Committee, the proponent will submit the proposal into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

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.

Adjustment Type	d. Nighttime Offloads/Routes
Adjustment Detail	i. Review nighttime operations.
Evaluation	The evaluation of nighttime operations is covered in multiple areas within this document. See the following responses: • Part 1 f.iii • Part 2 a.ii a • Part 2 a.ii c • Part 2 e.i. • Part 2 e.ii. • Part 2 e.iii. • Part 2 f.iv • Part 2 f.vi. • Part 2 g.ii.
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	FAA will provide current analysis of the proposed changes to the Select Committee for discussion and determination, noting that changes in where aircraft are typically vectored off procedures would result in a shift of traffic, and subsequently noise, over residential areas. If approved by the Select Committee, the proponent will submit the PBN procedure proposals into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

Adjustment Type	d. Nighttime Offloads/Routes
Adjustment Detail	ii. Review cargo flight operations to determine if previous actions have adequately addressed all issues.
Evaluation	• It was found that very few cargo flights occur at night. • Cargo flights account for 2% of night time (10pm – 7 am) SERFR flights.
Supporting Analysis	See Appendix E
Feasibility Analysis	Feasible
Next Steps	FAA will provide current analysis of the proposed changes, as summarized in Part 3.d.i, to the Select Committee for discussion and determination, noting that changes in where aircraft are typically vectored off procedures would result in a shift of traffic, and subsequently noise, over residential areas. If approved by the Select Committee, then the proponent will submit the PBN procedure proposals into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

Solution Area 4:

Create a New South Transition for the NIITE SID

RESPONSE TABLES

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.

Adjustment Type	f. PBN Procedures
Adjustment Detail	iii. Study the feasibility of creating new transitions for the NIITE departure for airports to southbound destinations.
Evaluation	• The NIITE departure procedure is currently designed for northbound departures. • The corridor it utilizes is shared with HUSSH departures off OAK, as well as some SJC departures. • It may be operationally feasible to create a new south transition for the NIITE SID. • However, during periods of high departure demands - (typically 10 - 11 pm and 6 - 7am) moving south bound traffic onto the already saturated north bound departure would increase gate/taxiway congestion, the result being increased delays.
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	FAA will forward this proposal to the Select Committee for discussion. If approved by the Select Committee, the proponent will submit the proposal into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

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, , facility automation changes implemented, and the SFO community roundtable may need to be engaged.

Adjustment Type	a. Sequencing and Vector Points
Adjustment Detail	ii. Analyze adjusting air traffic to eliminate early turns over land. a) Focus on leaving aircraft over water as long feasible.
Evaluation	• The current interplay of departures and arrivals for SFO, SJC and OAK was extensively studied during the NorCal Metroplex. • As part of this process, moving procedures more over water was considered. Given the demand on the airspace is generally more than the procedures alone can accommodate. Procedures which allow aircraft the shortest route in or out of the NorCal Airspace were chosen to prevent extensive ground delays. • When demand lessens (for example during 1am – 6am) ATC has more flexibility to place aircraft on procedures which take aircraft on a longer path out or into the NorCal Airspace and over less noise-sensitive areas, without compromising safety or increasing ground delays. This is why the NIITE, HUSSH, FOGGG and the GNNRR departures were designed and implemented. During the period from 1am – 6am, these departures are used 88% of the time. • To accommodate the arrival and departure demands, ATC often needs to vector aircraft off procedures. While it is not feasible to re-design the procedures to allow aircraft to stay over water, it may be possible to change the point where aircraft are vectored off the procedure, without increasing ground delays. • Analysis indicates that aircraft are typically vectored off the NIITE and CNDEL procedures before reaching the NIITE and CNDEL waypoints respectively, minimizing how long these flights stay over water.
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	FAA will provide analysis of the proposed changes to the Select Committee for discussion and determination, noting that when aircraft are vectored off procedures a shift of traffic, and subsequently noise, can occur over residential areas.

Adjustment Type	f. Instrument Flight Procedures (IFP)
Adjustment Detail	i. Study the feasibility of creating new transitions for the NIITE departure for departures to southbound destinations.
Evaluation	• The NIITE departure procedure is currently designed for northbound departures. • The corridor it utilizes is shared with HUSSH departures off OAK, as well as some SJC departures. • It may be operationally feasible to create a new south transition for the NIITE SID. • However, during periods of high departure demands - (typically 10 - 11 pm and 6 - 7am) moving south bound traffic onto the already saturated north bound departure would increase gate/taxiway congestion, the result being increased delays. NOTE: Evaluation above is the same as Part 1 f.iii.
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	FAA will forward this proposal to the Select Committee for discussion. If approved by the Select Committee, the proponent will submit the proposal into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

Adjustment Type	g. Opposite Direction Operations (ODO)
Adjustment Detail	ii. Assess potential options for night operations.
Evaluation	There is one feasible possibility for a night time south departure: • Create a south transition on the NIITE departure (from RWY 28/01) The 050 heading is already proceduralized through the NCT SOP and is already used as much as possible at night.
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	The FAA will forward the NIITE south transition proposal to the Select Committee for discussion. If approved by the Select Committee, the proponent will submit the proposal into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

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.

Adjustment Type	d. Nighttime Offloads/Routes
Adjustment Detail	i. Review nighttime operations.
Evaluation	The evaluation of nighttime operations is covered in multiple areas within this document. See the following responses: • Part 1 f.iii • Part 2 a.ii a • Part 2 a.ii c • Part 2 e.i. • Part 2 e.ii. • Part 2 e.iii. • Part 2 f.iv • Part 2 f.vi. • Part 2 g.ii.
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	FAA will provide current analysis of the proposed changes to the Select Committee for discussion and determination, noting that changes in where aircraft are typically vectored off procedures would result in a shift of traffic, and subsequently noise, over residential areas. If approved by the Select Committee, the proponent will submit the PBN procedure proposals into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

Adjustment Type	d. Nighttime Offloads/Routes
Adjustment Detail	ii. Review cargo flight operations to determine if previous actions have adequately addressed all issues.
Evaluation	• It was found that very few cargo flights occur at night. • Cargo flights account for 2% of night time (10pm – 7 am) SERFR flights.
Supporting Analysis	See Appendix E
Feasibility Analysis	Feasible
Next Steps	FAA will provide current analysis of the proposed changes, as summarized in Part 3.d.i, to the Select Committee for discussion and determination, noting that changes in where aircraft are typically vectored off procedures would result in a shift of traffic, and subsequently noise, over residential areas. If approved by the Select Committee, then the proponent will submit the PBN procedure proposals into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

Solution Area 5:

Increasing Percentage of CNDEL Flights Which Remain on CNDEL Until at Least the CNDEL Waypoint

RESPONSE TABLES

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.

Adjustment Type	a. Altitude	b. Track
Adjustment Detail	ii. Analyze reducing impacts of SSTIK, WESLA, and CNDLE departures.	i. Analyze moving the SSTIK and PORTE departures more over water. ii. Analyze reducing the impacts of SSTIK, WESLA, and CNDLE departures

Evaluation	• Given the 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 potentially causes a domino effect, affecting all of the136 departure and arrival procedures associated with the major airports within the NorCal Airspace. Therefore before an adjustment is undertaken, a thorough investigation is necessary to evaluate any potential gains and losses resulting from the necessary adjustment of other procedures.
	• To maximize the use of Optimized Profile Descents (OPDs) on the most used arrivals, Air Traffic Control (ATC) vectors aircraft off of departures and lesser used arrivals. OPDs offer benefits for all stake holders. They provide efficient paths to the runway for arriving aircraft, which reduce carbon emissions. OPDs may reduce noise impacts, because they minimize level segments and allow engine idle descents along the same ground track of a procedure.
	• Due to the large capacity demands of the multiple airports served through the NorCal Airspace, departures to the south have historically been vectored as soon as possible.
	  • It is unlikely any procedural adjustment would significantly change the way the southern departures are actually flown.
	  • It may be possible to change the point at which the aircraft are typically vectored off the procedures, but there may be an increase in delays.	

Supporting Analysis	See Appendix B	
Feasibility Assessment	Feasible	
Next Steps	FAA will provide analysis of the proposed changes to the Select Committee for discussion and determination. Changes in where aircraft are routed will result in a shift of traffic, and potentially less track dispersion over residential areas.	

Adjustment Type	c. Waypoint
Adjustment Detail	ii. Analyze making adjustments to PORTE departure to maximize offshore routing.
Evaluation	See response to Part 1 a.ii See response to Part 1 b.i See response to Part 1 b.ii
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	FAA will provide analysis of the proposed changes to the Select Committee for discussion and determination. Note, changes in where aircraft are routed will result in a shift of traffic, and potentially less track dispersion over residential areas.

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, , facility automation changes implemented, and the SFO community roundtable may need to be engaged.

Adjustment Type	a. Sequencing and Vector Points
Adjustment Detail	ii. Analyze adjusting air traffic to eliminate early turns over land. a) Focus on leaving aircraft over water as long feasible.
Evaluation	• The current interplay of departures and arrivals for SFO, SJC and OAK was extensively studied during the NorCal Metroplex. • As part of this process, moving procedures more over water was considered. Given the demand on the airspace is generally more than the procedures alone can accommodate. Procedures which allow aircraft the shortest route in or out of the NorCal Airspace were chosen to prevent extensive ground delays. • When demand lessens (for example during 1am – 6am) ATC has more flexibility to place aircraft on procedures which take aircraft on a longer path out or into the NorCal Airspace and over less noise-sensitive areas, without compromising safety or increasing ground delays. This is why the NIITE, HUSSH, FOGGG and the GNNRR departures were designed and implemented. During the period from 1am – 6am, these departures are used 88% of the time. • To accommodate the arrival and departure demands, ATC often needs to vector aircraft off procedures. While it is not feasible to re-design the procedures to allow aircraft to stay over water, it may be possible to change the point where aircraft are vectored off the procedure, without increasing ground delays. • Analysis indicates that aircraft are typically vectored off the NIITE and CNDEL procedures before reaching the NIITE and CNDEL waypoints respectively, minimizing how long these flights stay over water.
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	FAA will provide analysis of the proposed changes to the Select Committee for discussion and determination, noting that when aircraft are vectored off procedures a shift of traffic, and subsequently noise, can occur over residential areas.

Adjustment Type	a. Sequencing and Vector Points
Adjustment Detail	ii. Analyze adjusting air traffic to eliminate early turns over land. b) Keep aircraft on the SSTIK departure until the SSTIK waypoint before turning.
Evaluation	• The SSTIK Departure is an RNAV 1 departure. This means aircraft are considered to be on the procedure as long as they are within 1NM of the procedural track. • The FAA found that 99% of SSTIK departures are within 1NM of the procedure until at least the SSTIK waypoint. • The same analysis was repeated for the WESLA and the CNDEL departures. 98% of WESLA departures remain within 1NM of the procedure until at least the WESLA waypoint. 46% of CNDEL departures remain within 1NM of the procedure until at least the CNDEL waypoint. • It may be possible to change the point where aircraft are vectored off the CNDEL departure, without increasing ground delays.
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible (CNDEL)
Next Steps	FAA will provide analysis of the CNDEL proposed changes to the Select Committee for discussion and determination. Note that when aircraft are vectored off procedures a shift of traffic, and subsequent noise, can occur over residential areas.

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.

Adjustment Type	d. Nighttime Offloads/Routes
Adjustment Detail	i. Review nighttime operations.
Evaluation	The evaluation of nighttime operations is covered in multiple areas within this document. See the following responses: • Part 1 f.iii • Part 2 a.ii a • Part 2 a.ii c • Part 2 e.i. • Part 2 e.ii. • Part 2 e.iii. • Part 2 f.iv • Part 2 f.vi. • Part 2 g.ii.
Supporting Analysis	See Appendix B
Feasibility Assessment	Feasible
Next Steps	FAA will provide current analysis of the proposed changes to the Select Committee for discussion and determination, noting that changes in where aircraft are typically vectored off procedures would result in a shift of traffic, and subsequently noise, over residential areas. If approved by the Select Committee, the proponent will submit the PBN procedure proposals into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

Adjustment Type	d. Nighttime Offloads/Routes
Adjustment Detail	ii. Review cargo flight operations to determine if previous actions have adequately addressed all issues.
Evaluation	• It was found that very few cargo flights occur at night. • Cargo flights account for 2% of night time (10pm – 7 am) SERFR flights.
Supporting Analysis	See Appendix E
Feasibility Analysis	Feasible
Next Steps	FAA will provide current analysis of the proposed changes, as summarized in Part 3.d.i, to the Select Committee for discussion and determination, noting that changes in where aircraft are typically vectored off procedures would result in a shift of traffic, and subsequently noise, over residential areas. If approved by the Select Committee, then the proponent will submit the PBN procedure proposals into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.

Solution Area 6:

Improve Aircraft Set Up and Sequencing Between Facilities

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.

Adjustment Type	b. Interactions and agreements	c. Time Based Flow Management (TBFM)
Adjustment Detail	i. Review facility agreements for possible changes to aircraft set up and sequencing.	i. Review the current and projected status of using TBFM procedures.
Evaluation	• FAA controls the flow of traffic. • Aircraft can be spaced out more, but there would be additional delays and restrictions • The FAA is developing metering tools which may be used to better meter the SERFR. • This would mean that once SFO Class B is changed, more flights would be on the OPD.	
Supporting Analysis	Not applicable	
Feasibility Assessment	Feasible	
Next Steps	The FAA is currently pursing better ways to meter the traffic into SFO.	

Adjustment Type	b. Interactions and agreements
Adjustment Detail	ii. Review facility agreements to ensure they are effective and efficient with regard to routing and speeds.
Evaluation	• The current interplay of departures and arrivals for SFO, SJC and OAK was extensively studied during the NorCal Metroplex. • The intention was to provide a system of procedures which best minimized ground delays while complying with all safety criteria. • This was partially achieved by prioritizing the design of procedures to optimize the busiest routes. • Facility agreements were reviewed as part of the NorCal Metroplex to support these optimized procedures. • In addition, existing facility agreements undergo regular review and modification for improvement.
Supporting Analysis	Not applicable
Feasibility Assessment	Feasible
Next Steps	FAA is investigating potential improvement through better ways of metering traffic.

Adjustment Type	c. Time Based Flow Management (TBFM)
Adjustment Detail	ii. Review the impact of using TBFM on current noise issues.
Evaluation	• If the FAA is successful in better metering traffic on the SERFR, then this would potentially increase the number of aircraft able to stay on the procedure. • This may reduce the possible noise associated with vectoring aircraft off the procedure around the EPICK waypoint. • Once the Class B is changed to contain the SERFR Arrival, this would mean that a greater percentage of arrivals would be able to execute the OPD as designed.
Supporting Analysis	Not applicable
Feasibility Assessment	Feasible
Next Steps	FAA will continue to investigate metering improvements and the SFO Class B updates.

Adjustment Type	d. Nighttime Offloads/Routes
Adjustment Detail	ii. Review cargo flight operations to determine if previous actions have adequately addressed all issues.
Evaluation	• It was found that very few cargo flights occur at night. • Cargo flights account for 2% of night time (10pm – 7 am) SERFR flights.
Supporting Analysis	See Appendix E
Feasibility Analysis	Feasible
Next Steps	FAA will provide current analysis of the proposed changes, as summarized in Part 3.d.i, to the Select Committee for discussion and determination, noting that changes in where aircraft are typically vectored off procedures would result in a shift of traffic, and subsequently noise, over residential areas. If approved by the Select Committee, then the proponent will submit the PBN procedure proposals into the FAA's Performance Based Navigation (PBN) Implementation Process, as defined in the FAA Order 7100.41.