

**Report of the
Ad Hoc Advisory Committee
on South Flow Arrivals**

Approved May 18, 2018

DRAFT

Dear Tony DiBernardo:

With this letter, I convey to you the final recommendations of the Ad Hoc Advisory Committee on South Flow Arrivals.

These recommendations reflect the work of the fourteen-member Committee (see list below), over the course of eight meetings during the past six months.

The focus of this Committee has been the south flow arrival path into San Jose International Airport (SJC). During times of inclement weather, some mornings, or during frontal passages, the wind at SJC will blow from the south. For safety reasons, aircraft must take off and land into these southerly winds, requiring the airport to operate in "south flow," an alternate arrival path into SJC that allows aircraft to land and take off into the wind.

During these times, aircraft have followed a basic traffic pattern covering the area to the west of SJC over San Jose, Cupertino, Sunnyvale, Mountain View, Palo Alto and Santa Clara, before turning east to return to the airport. As these weather changes - the airport returns to "north flow," the most common configuration, and Air Traffic Control begins directing aircraft to arrive over downtown San Jose.

It is noted that the airspace over Santa Clara County and the entire San Francisco Bay Area is one of the most complex airspace for the Federal Aviation Administration (FAA) to conduct safe flight operations. There are three major international airports as well as numerous smaller airports. The interactions of all these facilities and weather play a part in the flight procedures that are used at SJC. The focus of this Committee is on the procedures that are used for south flow arrivals at SJC.

The Committee's recommendations can succinctly be prioritized as:

- Fly an alternate or more dispersed approach;
- Modify procedures to reduce the ground noise generated by aircraft;
- FAA Policy Changes;
- Avoid noisy flight maneuvers;
- Recommendations for SJC;
- Explore single regional noise reporting system.

The Ad Hoc Committee reviewed and prioritized numerous noise mitigation recommendations (Attachment X) and has listed the top ranked mitigations under the appropriate category.

Having conveyed these recommendations, we request that the FAA and SJC:

- Evaluate and report on the consequences/impact of each recommendation
- Consult with the committee/Cities Association to determine which appropriate recommendations to implement
- Provide written responses documenting the FAA and SJC evaluation and conclusions on what has been requested
- Provide a timeline for when the committee can expect documented responses
- Continue to prioritize safety of flight as its number one priority, but also to raise the issue of ground level aircraft noise so that the FAA can better mitigate the impact to our residents

The Committee believes timely assessment, prioritization and implementation of the recommendations will provide noise mitigation to the community experiencing the impacts of noise from south flow arrivals.

Sincerely,

Glenn Hendricks
Mayor, Sunnyvale

Chair, Ad Hoc Advisory Committee on South Flow Arrivals Committee

List of Committee Members

- Councilmember Jeffery Cristina – Campbell
- Mayor Savita Vaidhyanthan – Cupertino
- Vice Mayor Jean (John) Mordo – Los Altos
- Mayor Gary Waldeck – Los Altos Hills
- Councilmember Bob Nunez – Milpitas
- Councilmember Rowena Turner – Monte Sereno
- Councilmember Rene Soring – Morgan Hill
- Vice Mayor Lisa Matchak – Mountain View
- Councilmember Lydia Kou – Palo Alto
- Mayor Mary-Lynne Bernald – Saratoga
- Councilmember Charles “Chappie” Jones – San Jose (Vice Chair)
- Councilmember Raul Peralez – San Jose
- Vice Mayor Kathy Watanabe – City of Santa Clara
- Mayor Glenn Hendricks – Sunnyvale (Chair)

List of Committee Alternate Members

- Mayor Liz Gibbons – Campbell
- Councilmember Steven Scharf – Cupertino
- Vice Mayor Lynette Lee Eng – Los Altos
- Vice Mayor Marsha Grilli – Milpitas
- Vice Mayor Evert Wolsheimer– Monte Sereno
- Councilmember Larry Carr – Morgan Hill
- Mayor Lenny Siegel – Mountain View
- Vice Mayor Eric Filseth – Palo Alto
- Councilmember Howard Miller – Saratoga
- Councilmember Johnny Khamis – San Jose
- Councilmember Teresa O’Neill – City of Santa Clara
- Vice Mayor Larry Klein – Sunnyvale

List of Meeting Dates

- November 27, 2016 – Organizational Meeting – City of San José Committee Room
- January 26, 2018 – City of San José Council Chambers
- February 23, 2018 – SJC, Boeing Conference Room
- March 9, 2018 – SJC, Boeing Conference Room
- March 23, 2018 - SJC, Boeing Conference Room
- April 13, 2018 – SJC, Boeing Conference Room
- April 27, 2018 – SJC, Boeing Conference Room
- May 18, 2018 – SJC, Boeing Conference Room

Acknowledgements

The level and intensity of aviation noise experienced by residents of Santa Clara County is dependent on various factors including proximity to existing flight paths, time of day, and weather conditions. The noise consequences from the implementation of NextGen and overall increase of flights in our region, are having a negative impact on the quality of life of our residents. In response to growing community complaints and concerns about aviation noise, Committee members request that the FAA assess, prioritize and implement timely noise mitigation solutions.

The Committee would like to thank the San Jose City Council for initiating the Ad Hoc Committee on South Flow Arrivals, thereby demonstrating through the Committee their commitment to proactively identify mitigations to these challenges.

The Committee would also like to acknowledge and thank the Federal Aviation Administration (FAA), as they have attended every meeting with knowledgeable and committed staff. Through various presentations and guest speakers, the FAA demonstrated a real effort to share information and educate the Committee and public about the complexity of the airspace among other issues. The committee feels the FAA participated in these meetings as a willing partner in search of practical solutions.

The San Jose Airport staff has been fantastic and true partners in this effort. The Committee is appreciative of the meeting space and coordination provided by the staff. In particular, the Committee would like to recognize Mathew Kazmierczak, Manager of Strategy & Policy at San Jose International Airport for his outstanding knowledge support.

I want to thank all the members of the Committee for the countless hours spent trying to problem solve such a complex issue. The calm, rational thoughtfulness that the members brought to every meeting created a great collaborative environment.

Most importantly, the Committee wishes to thank the members of the public who attended these meetings and/or provided input. Our residents clearly showed a passion for this topic and a zeal for wanting to find transparent solutions that would work for all parties involved. They are focused on sharing their experiences, learning about the constraints and offering perspective on possible mitigations.

What Are South Flow Operations?

Normally, aircraft at SJC land descending from the south (over parts of downtown San José) and take off heading north. However, under certain weather conditions (mostly when the wind shifts direction at the Airport and flows from the south at higher speeds), for the sake of operational safety, the FAA requires pilots of arriving aircraft to follow an arrival procedure that can take descending aircraft over parts of San Jose, Cupertino, Sunnyvale, Mountain View, Palo Alto and other communities as they prepare to land at SJC approaching from the North flying South. When that arrival procedure is used, air operations are in “south flow.”

More recently, the use of the south flow procedure has increased significantly as wind conditions that cause the need for south flow operations have started earlier in the day and have been lasting longer. In addition, since 2015, new air traffic control technology installed by the FAA and in aircraft have resulted in more precise and compacted arrival patterns, especially over San Jose, Sunnyvale, Cupertino and Mountain View. Use of the NextGen technology has increased per-flight noise for residents. While this has reduced noise for some residents, noise has increased for those residents living directly under the more precise arrival and approach flight paths.

South Flow and the Bay Area Metroplex

The FAA has testified that the Bay Area is the second most complicated metroplex location after New York City for air traffic given the proximity and flight patterns of its three primary airports: SFO, SJC, and OAK. For safety purposes, air traffic procedures are required to maintain a safe vertical and horizontal distance from other aircrafts and approach and departure flight paths.

FAA staff has presented that a south flow arrival approach is a more complicated procedure than north flow given its proximity to other flight procedures for SFO traffic, and as such it is a less preferred procedure when compared with north flow. The FAA stated that they only switch to south flow when wind and weather conditions require it. The preferred approach is north flow where planes approach SJC from the south flying north, as there is less air traffic from other airports.

Formation of the Ad Hoc Advisory Committee on South Flow Arrivals

In November 2016, Sunnyvale and Mountain View residents attended the SJC Airport Commission meeting to ask the Commission to address their noise concerns. The Commission requested staff to write the FAA to ask for solutions to address the south flow noise issue. While the FAA responded to staff’s correspondence, the response offered no adjustments in the procedure.

Sunnyvale and Mountain View residents returned to the Commission in February 2017 to request the Commission’s support for the formation of a body to address south flow noise issues. In response, the Commission voted unanimously to recommend the formation of a body that includes FAA participation.

In March 2017, the Airport hosted a meeting organized by Congressman Ro Khanna's office. Elected officials from Sunnyvale, Mountain View, Cupertino, San José, the FAA, and the Airport attended to discuss the south flow issue and possible solutions. There was consensus that it would be constructive to have public information and discussion forums to understand why the south flow procedure is used and to review possible solutions to reduce the noise for the most impacted residents. The FAA and the Airport would participate in the forums.

In response to the SJC Commission's recommendation, Airport staff reviewed the formation and structure of the SFO Select Committee on South Bay Arrivals, which was an ad hoc noise committee formed in May 2016 by Congresswoman Anna Eshoo, Congresswoman Jackie Speier, and former Congressman Sam Farr. The Select Committee brought together elected officials from the jurisdictions of three counties to look at the noise impacts of the FAA's 2015 implementation of its NextGen technology. The Committee ultimately made a series of consensus-based recommendations before disbanding in November 2016. The three Congressional offices endorsed and transmitted the Committee's recommendations to the FAA for review. The FAA is now studying those recommendations.

In reviewing the Select Committee model, Airport staff determined that the ad hoc model is a good process for conducting a regional discussion on possible solutions to address the noise impacts of the south flow procedure at SJC. Based on this, the City of San José formed the Ad Hoc Advisory Committee on South Flow Arrivals to discuss possible solutions. The Committee is an advisory body with no legal authority. Its purpose is to provide potentially feasible and consensus-based recommendations to the FAA to mitigate the noise impacts of the south flow procedure.

To encourage the maximum degree of inclusiveness and consensus, all Santa Clara County cities were invited to participate on the Committee. FAA staff and San José Airport staff have also participated in the discussions with the FAA providing technical support and the Airport providing non-technical support.

- **Fly an alternate or more dispersed approach**

One of the changes that has come with NextGen navigation into San Jose International Airport (SJC) is switching from a radar-based approach to a GPS approach. That in conjunction with OPD, our residents experience a concentration of the path that aircraft fly through the sky. This creates the effect of having aircraft fly through the same space in the sky more consistently. The resident's perceptions of this is the creation of a "rail" over certain neighborhoods and houses. In effect, causing a fewer number of residents to bear the brunt of the ground effect noise from aircraft flying overhead.

It should be noted that RNP is one of the tools and procedures used by the FAA that contributes to creating this "rail" impact to residents.

Prior to the implementation of NextGen, the aircraft flying overhead were dispersed over a broader area. This had the effect of not concentrating ground effect air noise over specific neighborhoods and houses. Thereby, reducing the negative effects on residents. A dramatic increase in noise complaints appeared after the implementation of Nextgen.

The FAA has stated that having a predictable, repeatable and consistent set of procedures improves safety, workload and communication for aircraft preparing for landings.

The attached spreadsheet identifies many suggestions for "how" this might be accomplished. (See spreadsheet items Q through CC).

Request to the FAA #1: The Ad Hoc Committee requests the FAA to explore options and procedure changes that will still allow for the safe landing of aircraft at SJC, AND return to a more dispersed distribution of aircraft. (Using the criteria listed below)

Dispersion can mean different things in each of the impacted cities:

Without being prescriptive of "how" to achieve dispersion over each city, the following details will try and define success criteria for dispersion of aircraft over each city.

San Jose

San Jose representative needs to define what we want here

Cupertino

Cupertino representative needs to define what we want here

Sunnyvale

For the City of Sunnyvale – dispersion would mean even distribution of aircraft between the ZORSA and PUCKK waypoints. Not that aircraft would fly over these specific points, but rather use these waypoints (ZORSA and PUCKK) as an

eastern and western outside logical boundary of where aircraft would fly over the city. Define a set of procedures, rules or processes, that would enable FAA to safely and semi-evenly distribute traffic over Sunnyvale between these two designated waypoints (measured over time).

Mountain View

For the City of Mountain View – dispersion of aircraft is essential to a solution. Two rails (straight and semi-circular) have sharply concentrated noise over Mountain View in recent years. These rails come from use of an RNP approach and a new vectoring procedure. Mountain View would like to see the dispersion that existed before 2012, even if that means returning some control to pilots. Can airplanes that are capable of turns that are tighter than the RNP turn begin their turn prior to reaching ZORSA, dispersing traffic to the East of the RNP rail? Can traffic on the STAR procedures make their turn at or after JESEN at slightly different locations and with slightly different headings, perhaps by recreating PUCKK as the terminal waypoint (infrequently reached) on the arrival procedure? This could ‘spray’ traffic across Sunnyvale and Mountain View and along the length of Hwy 101 as before. Would creation of a charted visual approach help? With different procedures, could ATC contribute to these ends? Recreating the long-standing traffic patterns that existed prior to 2012 would reduce complaints significantly.

Palo Alto

Palo Alto representative needs to define what we want here

One Possible Alternative Approach

The following is one possible alternative approach for the FAA to explore. There may be others and the Committee encourages any and all options to be fully reviewed.

When the south flow arrival pattern is initiated for San Jose International (SJC) airport, most traffic flies toward and through the ZORSA waypoint over San Jose, Cupertino, Sunnyvale, Mountain View and Palo Alto to make a right-hand turn to intersect the final approach pattern to land.

In reviewing radar traffic, there is some amount of traffic that lands at SJC during south flow that is vectored to land from the East. That traffic comes in and makes a left-hand turn to intersect the final approach.

Request to the FAA #2: The Ad Hoc Committee requests the FAA to initiate a full procedure evaluation to explore creating a Procedure that aircraft could use to land at SJC that would take advantage of this Eastern arrival option.

Further, without being prescriptive of “how” to achieve this Eastern approach for south-flow – the success criteria for such an approach would be for a minimum of 25% of the south-flow traffic to use this approach. Having aircraft land from over the bay would reduce the ground level impact noise to the previously identified cities.

The success criteria and FAA evaluation process would also need to ensure that we are not moving ground level impacting noise to other residential communities.

The attached spreadsheet identifies suggestions for “how” this might be accomplished. (See spreadsheet items M, N, P).

Regardless of the outcome of this evaluation, the Committee requests the FAA to not lose or stop the vectored approach that some aircraft currently use to approach and land at SJC.

- **Modify procedures to reduce the ground noise generated by aircraft**

It has been mentioned multiple times that the objective the Ad Hoc Committee is trying to achieve is the reduction and/or mitigation of ground level impacting noise from aircraft. Items A through K from the spreadsheet are suggestions for how to achieve some of this noise reduction.

Per information that was provided by the FAA at the April 13, 2018 Ad Hoc Committee meeting, the highest probability items to implement are D, E, F of the spreadsheet. (The FAA's comments were not a commitment that these particular items could be implemented or that they would achieve the desired results.)

Request to the FAA #3: The Ad Hoc Committee requests the FAA to initiate a full procedure evaluation to implement item E and F. The purpose being to implement the concept of item D.

These items are based in the concept that “altitude is our friend” as it relates to ground impacting noise from aircraft. The higher the aircraft, the less its noise will impact residents on the ground.

If there are other suggestions that the FAA could suggest to be reviewed to raise the altitude of aircraft, these should also be included in the evaluations.

The Ad Hoc Committee wants to acknowledge that the whole purpose of the South Flow arrival pattern or any arrival pattern is to get aircraft safely to the ground and land.

The success criteria for this set of items is to safely land aircraft at SJC but keep the aircraft as high as possible (for as long as possible), while still allowing for safety and appropriate decent paths and sequencing to land at the airport.

- **FAA Policy Changes**

- **Sound Monitoring in the Impacted Cities**

Since the implementation of NexGen, the FAA has not changed how it reviews noise impacts to communities. Noise impacts due to changes in aviation paths and procedures have been reviewed using noise modeling technology instead of actual measurement of noise generated from aircraft. The Committee requests the FAA to monitor actual noise generated and furthermore establish a benchmark to measure pre and post implementation of recommended changes; thereby making it easier to analyze effectiveness.

Request to the FAA #4: Implement monitoring in areas throughout Santa Clara County to measure the effectiveness of noise mitigation solutions. Noise data captured by sound monitoring should be used by the FAA to validate the modeling tools the FAA uses as part of its environmental impact evaluations.

The point of noise modeling is to simulate real-world conditions. The noise models used by the FAA should be calibrated to sound on the ground under varying weather conditions. If certain south flow flight procedures have been optimized for sound, the procedure designers should ensure that they have calibrated their procedures to the weather conditions most prevalent when those procedures are to be deployed.

The attached spreadsheet identified suggestions for “how” this might be accomplished. (See items K and OO).

Request to the FAA #5: The Ad Hoc Advisory Committee on South Flow Arrivals is aware that for each new potential Aviation route into the San Francisco Metroplex, that a noise simulation and prediction is/was required. The Committee requests that the FAA provide those simulation results that include predicted noise levels and all other associated data.

The committee requests the FAA’s environmental reports that have been prepared for routes into the Metroplex for the past three years be provided to the Committee for the examination, analysis and comment.

- **Improve Public Outreach**

Near the end of this committee's duration, it was discovered that the FAA was in the process of evaluating a change for the approach procedures for SJC (ILS). No one representing the FAA at these meetings or the public was aware this change was being considered.

Once the FAA project was brought to FAA representatives attention, the evaluation was slowed down so that a full process including improved public input could take place. (Thank you to the FAA Officials).

But, this item highlighted the transparency and ease (or lack thereof) for members of the public and even the FAA to keep track and become aware of procedures changes that can impact local residents.

Included in the Appendix is a letter from the Mayors of Los Altos, Mountain View and Palo Alto concerning the lack of transparency on this issue.

Request to the FAA #6: The Committee is requesting the FAA to improve the notification mechanisms to better alert local communities when procedures are being reviewed. Just posting to the FAA's IFP Gateway website at the National level is not sufficient to provide clear, layman understandable language and transparent information to the public. There needs to be better regionalization or categorization of the possible changes. There should also be a mechanism for public officials and members of the public to be notified of changes that are being proposed in their region.

- **Avoid noisy flight maneuvers**

The Committee spent a considerable amount of time discussing and hearing from FAA, traffic control and airport officials on noise mitigation through airplane flight modifications.

Committee members explored scenarios where changing airplane speed, altitude, and aircraft vectoring could have a noise reduction impact, below are the recommended mitigations:

Items A, B, G, H, J, K

Given the technical complexity of these items, the Committee does not have a specific ranking for these. But the success criteria for any of these are the same. Implement changes that allow for the continued safe flight operations of aircraft while reducing the impact of ground level noise on our impacted communities.

Request to the FAA #7: The Committee is requesting the FAA to review these suggestions and provide a written response about the feasibility of implementing these.

- **Recommendations for SJC to explore implementing noise reducing retrofits where possible**

Mitigating noise should also be explored from an airport operator perspective and consideration should be given to airfield design, such as evaluating the feasibility of runway extensions, new runway construction, or relocation of runway thresholds. Operationally, consideration should be given to modifying arrival flight profiles and capitalizing on advanced navigational technologies, as well as reviewing noise curfews. Other noise management options include working with airlines and pilots to manage airplane noise, examples include the Fly Quiet Program, and creating a Pilot Awareness Program.

Request to SJC #A: The Committee recommends that the San Jose Airport respond to the following recommendations and provide a response on feasibility of implementation. Prioritized items DD through LL

- **Explore single regional noise reporting system**

Currently, when any resident wants to register a complaint about aircraft noise, there is severe burden that is placed on the resident. The person reporting the issue, needs to research and find information about the aircraft, determine the destination airport, look up the noise reporting contact information for that arrival airport and then file the actual complaint. And then if they are registering complaints for a situation like south flow at SJC – they need to re-contact and go through the reporting process for each flight or noise incident.

This is an undue burden placed on the residents reporting noise concerns that have already been clearly defined and documented as occurring.

Request to the FAA #8 (or SJC, if they are the more appropriate body): The Ad Hoc Committee requests the FAA to initiate a study to look at creating a single Aircraft Noise Reporting System for the area, including, but not limited to: simplified reporting of information by the reporting person, analysis and publicly available reporting. The user interface for this system should minimize the number of clicks required to log a complaint.

Responses from the FAA

The Ad Hoc Advisory Committee on South Flow Arrivals was designed to be a limited term, ending after six-months from initiation. The Committee believes it is important to define a contact protocol once the Ad Hoc Advisory Committee on South Flow Arrivals has concluded, in order for the FAA to provide its response to the recommendations.

Recommendation: When the FAA has any feedback on the Committee's requests or additional questions, the FAA should contact:

- Mathew Kazmierczak, Manager of Strategy & Policy at San Jose International Airport
 - matthew.Kazmierczak@sanjoseca.gov
- Glenn Hendricks, Mayor of Sunnyvale and Committee Chair Person
 - mayor@sunnyvale.ca.gov
- Andi Jordan – Santa Clara County Cities Association
 - andi@citiesassociation.org

Depending on the information provided by the FAA, the designated contact representatives may:

- Pass information on from the FAA to Committee members
- Post information on the Committee website hosted by SJC
 - https://www.flysanjose.com/Ad_Hoc_Meetings
- Convene an informal meeting of the former committee members
- Provide responses to FAA questions
- Other actions, as may be deemed necessary

Appendix

- **Link to meeting minutes**
 - www.flysanjose.com/Ad_Hoc_Advisory_committee
- **FAA provided materials**
 - All FAA presentations are available on the Ad Hoc Advisory Committee website: https://www.flysanjose.com/Ad_Hoc_Meetings
 - FAA Presentations
 - January 26, 2018 – SJC North and South Flow: Pre and Post OAPM
 - March 23, 2018 – FAA Data regarding February 28, 2018 Request, Questions, and Next Steps
 - April 13, 2018 – FAA Data response to March 23, 2018 meeting
- **Spreadsheet of mitigation idea**
- **Letter from the Mayors of Los Altos, Mountain View and Palo Alto**
- **Electronic files received from residents**