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, 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 more dispersed Western approach;
- Fly other dispersed approach;
- Modify procedures to reduce the ground noise generated by aircraft;
- Implement FAA Policy Changes;
- Avoid noisy flight maneuvers;
- Implement noise management measures at SJC;
- Explore single regional noise reporting system.

The Ad Hoc Committee reviewed and prioritized numerous noise mitigation recommendations (See attached Appendix) and has listed the mitigations under the appropriate category.

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

- Evaluate and report on the consequences and impact of each mitigation measure in the spreadsheet in the appendix, prior to the implementation of any change
- 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 the feasibility of implementing what has been requested for each recommendation
- Provide a timeline for when the committee can expect documented responses
- Continue to prioritize safety of flight as its number one priority; and raise the priority 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
- Councilmember Savita Vaidhyanthan – Cupertino
- Mayor Jean (John) Mordo – Los Altos
- Councilmember Gary Waldeck – Los Altos Hills
- Councilmember Bob Nuñez – Milpitas
- Councilmember Rowena Turner – Monte Sereno
- Councilmember Rene Soring – Morgan Hill
- Vice Mayor Lisa Matichak – Mountain View
- Councilmember Lydia Kou – Palo Alto
- Mayor Mary-Lynne Bernald – Saratoga
- Councilmember Charles "Chappie" Jones – San José (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

- Councilmember 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 Leonard Siegel – Mountain View
- Vice Mayor Eric Filseth – Palo Alto
- Councilmember Howard Miller – Saratoga
- Councilmember Johnny Khamis – San José
- 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 important, 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. Since 2015, new air traffic control technology installed by the FAA and in aircraft have resulted in more precise and narrowly concentrated arrival patterns, especially over San Jose, Sunnyvale, Cupertino, Mountain View, and Palo Alto. Use of the NextGen technology has increased per-flight noise for residents. While this may have reduced noise for some residents, noise has definitely 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: San Francisco (SFO), San Jose (SJC), and Oakland (OAK). For safety purposes, air traffic procedures are required to maintain a safe vertical and horizontal distance from other aircrafts, as well as 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, Mountain View and Palo Alto 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 included 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 agreed to 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.

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.

These meetings have produced the recommendations that follow.

- **Fly More Dispersed Western Approach**

Prior to the implementation of NextGen, aircraft were dispersed over a broader area of air space thereby limiting concentrated negative effects on residents and neighborhoods. A dramatic increase in noise complaints resulted from the implementation of NextGen. NextGen, a program which switched a radar-based approach to a GPS approach, has resulted in the use of Required Navigation Performance (RNP) and Optimal Profile Descent (OPD). These tools and procedures create a concentration of flight paths. This has created a "rail" over specific neighborhoods and homes, where residents bear the brunt of ground effect noise.

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" to achieve a more dispersed Western approach. (See spreadsheet items Q through CC). The Ad Hoc Committee is requesting written responses from the FAA to these items.

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 success criteria listed below)

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

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

San Jose

The City of San José does not have a prescription for the dispersion of aircraft on the western south flow approach to the SJC.

Cupertino

For the City of Cupertino – dispersion would mean that flight paths are distributed and not concentrated over a narrow flight path. Current south flow flight paths appear to be from JESEN to ZORSA and not from JESEN to PUCKK, or from JESEN to any point between waypoints ZORSA and PUCKK. It would be preferable for flight paths to be more evenly distributed between JESEN/ZORSA flight paths and JESEN/PUCKK flight paths. Alternative flight paths from JESEN to any point between waypoints ZORSA and PUCKK may also be good options for achieving dispersion and avoiding narrow flight path concentrations

Sunnyvale

For the City of Sunnyvale, dispersion would mean even distribution of the existing 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 equivalently distribute traffic over Sunnyvale between these two designated waypoints (measured over frequent interval).

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.

Santa Clara

The City of Santa Clara is on the "Rail" in the North part of the City. The City is interested in determining how any changes would affect the City, but also finding modifications to the flight path to significantly decrease sound levels. One of the key inputs should be what an acceptable noise level is, and how can residents be empowered to have real-time information to assure that noise levels stay at acceptable levels. Are there better ways for residents to measure and report noise to the FAA (such as an App where residents can measure noise and report concerns immediately)?

Fly Other Dispersed Approach

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 makes a right-hand turn to intersect with the final approach pattern in order 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 maintain the current percentage of use (10%) of the Eastern approach for south-flow arrivals.

Milpitas

Maintaining the current frequency of use of the Eastern approach ensures that we are not "just" moving ground level impacting noise to other residential communities. The Ad Hoc Committee requests that should there be increased flight volume at SJC, the FAA implement an equal dispersing of those flights to all approaches so that one zone or area of communities is not burdened.

San Jose

San José strongly opposes any prescription for dispersion that would move more aircraft towards an Eastern approach to SJC during south flow. A move to fly more aircraft than currently diverted onto an Eastern approach has the potential to put more aircraft over some of the lower-income communities of San José and could present environmental justice and socioeconomic fairness concerns. When aircraft are in the normal north flow approach to SJC, San José residents already experience the largest share of aircraft noise, some 85 percent of the time.

The attached spreadsheet identifies suggestions for "how" this might be accomplished. (See spreadsheet items M, N, P). The Ad Hoc Committee is requesting written responses from the FAA to these items.

Regardless of the outcome of this evaluation, the Committee requests the FAA not lose or stop the vectored approach that some aircraft currently use to approach and land at SJC. It is important we do not reduce the amount of traffic using this path.

- **Modify Procedures to Reduce the Ground Noise Generated by Aircraft**

It has been mentioned multiple times that the objective the Ad Hoc Committee aim is to achieve 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 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 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 on the concept that all other things being equal, "altitude is our friend," as it relates to ground impact noise from aircraft. The higher the aircraft, the less its noise will impact residents on the ground.

If the FAA has additional suggestions on raising aircraft altitude, these should also be included in the evaluations.

The success criteria for this set of items is to safely land aircraft at SJC and keep the aircraft as high as possible for as long as possible without requiring added lift, brakes or jet thrust, while still allowing for safety, appropriate decent paths, and sequencing to land at the airport.

- # Implement 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 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 noise 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 Committee on South Flow Arrivals is aware that for each new potential aviation route into the San Francisco Metroplex, 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.

Improve Public Outreach

In April, it was discovered that the FAA was in the process of evaluating a change for the approach procedures for SJC Instrument Landing System (ILS), which would take effect in June of 2018. Neither the FAA meeting representatives, Committee, or the public were aware this change was being considered. The lack of public outreach to potential affected communities highlighted the need for transparency and improved public process and communication. 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 improve the notification mechanisms to better alert potential affected communities when procedures are being reviewed. Simply posting to the FAA's Instrument Flight Procedures (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 regional and local outreach process that informs public officials and members of the public when changes 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, C, 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 review these suggestions and provide a written response about the feasibility of implementation.

- **Implement Noise Management Measures at SJC**

Mitigating noise should also be explored from an airport operator perspective. 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

San José Airport has provided additional information for items DD through LL in the attached mitigation spreadsheet. This information ranges from federal regulations of noise and landing requirements to the information contained in SJC's noise reports.

- **Explore Single Regional Noise Reporting System**

The existing noise complaint system is confusing and places a significant burden on the complaint reporter, requiring fields such as aircraft type and destination airport. Before a complaint can be processed, contact information for the specific airport must be researched. A separate process exists for complaints on south flow aircraft noise. 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 #8A (or SJC, if they are the more appropriate body): The Ad Hoc Committee requests the FAA initiate a study to look at creating a single Aircraft Noise Reporting System for the area, including, but not limited to: Ease of reporting by the public; transparent agency analysis; agency response; and publicly access reporting results. The user interface for this system should minimize the number of "clicks" required to log a complaint.

Request to the FAA #8B: The Ad Hoc Committee requests the FAA initiate a study to use the information collected in 8A to identify and analyze noise trends that should be addressed.

Responses from the FAA

The Ad Hoc Committee on South Flow Arrivals was designed to be limited term, starting January 2018 and sunsetting May 2018. The Committee believes it is important to define a contact protocol once the Ad Hoc Advisory Committee on South Flow Arrivals has concluded 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

Additional Materials in the Appendices

- **Committee Meetings and Materials**
- **Noise Mitigation Recommendations**
- **Letter from the Mayors of Los Altos, Mountain View and Palo Alto**
- **Electronic files received from residents**
- **YouTube Videos of Committee Meetings**
    - **1/26/2018 - https://www.youtube.com/watch?v=0dMAvbNpmkM**
    - **2/23/2018 - https://www.youtube.com/watch?v=PUBy6Hf0kyc**
    - **3/23/2018 - https://www.youtube.com/watch?v=u7yt72AMFeA**