



Roundtable Glossary

Continued from other side

MISSED APPROACH: An instrument approach not completed by a landing. This may be due to visual contact not established at authorized minimums or instructions from air traffic control, or other reasons.

NAVAID: Navigational aid.

NOISE CONTOUR: A computer-generated line representing a line of equal noise level drawn on a base map.

NOISE EXPOSURE MAP (NEM): Maps prepared by airports under federal regulation according to a federal model depicting noise contours. NEMs also take into account potential land use changes around airports.

NON-DIRECTIONAL BEACON (NDB): A radio beacon transmitting non-directional signals that a pilot of an aircraft equipped with direction finding equipment can determine bearing to or from and can "home" on or track to or from the station.

NON-PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, GPS, NDB, or LOC.

OPERATION: A take-off or a landing. Every flight requires two operations, a take-off and a landing.

OUTER MARKER (OM): An ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline indicating to the pilot that he/she is passing over the facility and can begin final approach.

PASSUR SYSTEM: Passive Surveillance Receiver, a system capable of plotting ground tracks of individual aircraft in flight.

PRECISION APPROACH PATH INDICATOR (PAPI): An airport lighting facility in the terminal area navigation system used under VFR conditions, through a single row of two to four lights, radiating high intensity red or white beam to indicate whether the pilot is above or below the required runway approach path.

PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which an electronic glide slope is provided, such as ILS. GPS precision approach may be provided in the future.

RELIEVER AIRPORT: An airport to serve general aviation aircraft which might otherwise use a congested air carrier served airport.

REMOTE MONITORING STATION (RMS): Acoustical microphone placed in a community and recorded at San Francisco Airport's Noise Monitoring Center. A network of 29 RMS's generate data used in preparation of the airport's Noise Exposure Map.

SHORELINE DEPARTURE: Departure via Runways 28 that utilizes a right turn toward San Francisco Bay as soon as feasible. Considered a noise abatement departure procedure.

SINGLE EVENT: Noise generated by a single aircraft overflight.

STAR: Standard Terminal Arrival Route, a preplanned IFR arrival route printed for pilot use.

TRACON: Terminal Radar Approach Control, an FAA air traffic control service to aircraft arriving and departing or transiting airspace controlled by the facility. TRACONs control IFR and participating VFR flights. The TRACON for the Bay Area, Bay TRACON, is located at Oakland International Airport.

VECTOR: A heading issued to a pilot to provide navigational guidance by radar. Vectors are assigned verbally by FAA air traffic controllers.

VFR (VISUAL FLIGHT RULES): Rules governing procedures for conducting flight under visual meteorological conditions, or weather conditions with ceiling of 1,000 feet above ground level and visibility of three miles or greater. It is the pilot's responsibility to maintain visual separation, not the air traffic controller's, under VFR.

VISUAL APPROACH: Wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic facility and having an air traffic control authorization, may proceed to destination airport under VFR.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport lighting facility in the terminal area navigation system used primarily under VFR conditions. It provides vertical visual guidance to aircraft during approach and landing, by radiating a pattern of high intensity red and white focused light beams which indicate to the pilot that he/she is above, on, or below the glide path.

VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATION (VOR): A ground based electronic navigation aid transmitting navigation signals 360 degrees in azimuth, oriented from magnetic north. The historic basis for navigation in the national airspace system.

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From the Airport

Progress in mitigation

By John L. Martin
Director
San Francisco International Airport

Clearly, the soaring steel of what will be America's largest international terminal is the most visible sign of San Francisco International Airport's \$2.4 billion expansion. But attention to that project should not eclipse other work we have taken on as part of our expansion.

Of the measures identified as mitigation for our growth, I am proud that we continue to make real progress in completing those tasks.

The Airport's responsibilities include increased funding for noise insulation. Already, the Airport has funded approximately \$80.5 million out its \$120 million commitment to the noise insulation program, with around 6,149 homes completed since 1992.

The Airport is currently developing a scope of work and selecting a consultant for the back blast test house included in the mitigation plan. Test results will be available by the end of the year.

The PASSUR Tracking System, a tool the Airport agreed to use to evaluate flight patterns and noise abatement procedures, has been upgraded, extending its reporting range 25 percent.

The Airport has also begun to monitor late-night operations. Through my monthly report, statistics on night operations and preferred runway usage are released regularly. In recent years, noisier aircraft operations have been restricted from late-night operation and quieter Stage 3 aircraft account for 88 percent of all aircraft operations.

The Airport supports the Roundtable's efforts to address noise issues identified in its work plan. This year, we provided above and beyond our \$100,000 commitment for Roundtable administrative support.

The Roundtable and the Airport joined together to establish a work program to continue to cut noise impacts on the Peninsula. On behalf of the Roundtable, we are entering into con-

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ATAC models flight paths

"highways in the sky;" therefore, how is it possible to predict what might happen if air traffic control routes change?

This information could assist experts contemplating flight pattern adjustments as a way to reduce noise in selected areas. The Airport/Community Roundtable confronts this question often. Roundtable members and the public use the monthly Roundtable forum to suggest changes in the way aircraft approach or depart San Francisco International Airport to mitigate noise impacts in specific communities.

Air traffic control is the responsibility of the Federal Aviation Administration. The FAA operates according to published approach and departure procedures defined through exhaustive technical review by governmental and aviation industry safety organizations. The FAA's mandate is to manage federal air space in a way that guarantees maximum safe commercial use of the skies. Its system does change, but it is not subject to radical modification or

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From the Airport

Continued

tracts to implement those programs, including testing alternate routes through computer modeling, exploring the feasibility of an enclosure pen to help quiet jet engines, and buying additional noise monitors to better follow aircraft and understand their impacts locally.

By putting significant resources into completing these mitigation measures, we make a real difference in the lives of our neighbors. ■

From the Roundtable

ATAC helps Fast Track

By Pat Kelly
Chairman
Airport-Community Roundtable

A Roundtable innovation has been Fast Track, and a vital element of Fast Track promises to be services provided by a company called ATAC, described in detail elsewhere in this issue.

One of the first priorities of the 1997-98 Airport/Community Roundtable is to change the organization of the Work Program. The Work Program establishes our specific tasks and goals on an annual basis and requires semi-annual review. This goal-oriented method has proved its value many times over the years.

Fast Track is a refinement which selects a group of Work Program items and moves them to the top of the agenda for action or resolution within six months. One of the first Fast Track items is extended testing of an approach altitude increase over southern San Mateo County cities. This is a good example of how the Roundtable expects ATAC to assist the Fast Track process.

The purpose of an altitude increase is to give some noise relief to areas beneath an arrival route used by a few early-morning jumbo jets coming to SFO from the Pacific Rim.

A 1,000-foot altitude increase to 7,000 feet over a navigation aid in the area of Woodside puts aircraft farther away from residents, but more importantly configured in a quieter gliding and powered-down mode. Preliminary results have been promising.

The question is whether this altitude increase can extend to more hours to arrivals coming from the north and east without creating a conflict with take-offs climbing and turning to the south.

ATAC modeling should give us answers without having to redirect a single aircraft because ATAC uses FAA flight data to project the effect of traffic control changes on existing operations.

Computer modeling may prove to be one of the most effective tools at the Roundtable's disposal and may help us get an ever-larger portion of our work program on the Fast Track. ■

Policy against noise shift makes change a challenge

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tests by trial and error — for all the obvious reasons. The Airport/Community Roundtable has a similar constraint — a self-imposed policy against shifting noise from one community to another. This protects neighbors of San Francisco International Airport and guarantees that reductions in airport noise are real reductions in overall noise levels. However, it also does not lend itself to trial-and-error.

How can a promising idea be tested without requiring federal action or violating the Roundtable's no-noise-shift policy?

The answer is computer modeling.

For the first time the Airport/Community Roundtable, working through San Francisco International Airport Director John Martin, will have the benefit of computer modeling services provided by ATAC (pronounced "AAY-tack"), a Sunnyvale consulting firm.

ATAC simulates flight operations in controlled airspace like that which surrounds San Francisco International, testing "what-if?" scenarios without ever having to fly a plane. It can model where aircraft are likely to fly, where traffic conflicts are likely to arise and can lay the groundwork for reasonable guesses about how changes in flow would affect noise.

The key to ATAC is its data. Since the FAA is an ATAC client, the company has access to the same information the nation's air traffic control system uses. The company has modeled air traffic systems for most of the FAA's Terminal Radar Air Traffic Control centers (TRACONS), the radar and communications facility responsible for directing air traffic flow into and out of airports. Bay TRACON in Oakland, which handles all traffic into and out of San Francisco, Oakland and San Jose airports, is one of those.

San Francisco International Airport has hired ATAC at a cost of \$90,000 to assist in investigating Roundtable issues.

Five scenarios will be referred to ATAC through the Roundtable.

First is a Fast Track item submitted for ATAC modeling is a proposal for an offset ILS approach to Runway 28 Right.

Even during good weather and visibility, all operations at a controlled airport like SFO follow instrument landing rules. Electronic devices give aircraft precise guidance aligned with the centerline of the landing runway. Pilots know that even were they unable to see the runway, electronic guidance would take them to it.

This straight-in approach directs landing aircraft very close to or over residences adjacent to Beach Park Boulevard in Foster City. The idea of

an offset ILS is to skew the approach three degrees off center to the right as the pilot sees it.

Instead of being guided to the runway centerline, the aircraft would have to make a three degree left turn shortly before touching down.

This would move approaches farther away from homes in Foster City, but it would move them closer to aircraft arriving from Oakland. ATAC should be able to predict if and where a three-degree offset at SFO would create a conflict with Oakland arrivals or other traffic.

If the offset ILS were proved feasible from a safety standpoint, it would require a nearly quarter-million dollar commitment of federal funds for the electronic equipment and at least a year for construction.

Second on the list for ATAC is a study of how extended use of an approach altitude increase over the southern end of San Mateo County may affect departure traffic from both SFO and Oakland airports.

Such an altitude increase to 7,000 feet has been tested for some time in the early morning hours when departures are few and four or fewer arrivals from the Pacific Rim approach SFO over a period of four hours.

The idea appears to have helped reduce the noise of some approach flights over the south county by getting them higher and keeping them in a quieter glide mode for a longer time.

There are potential conflicts.

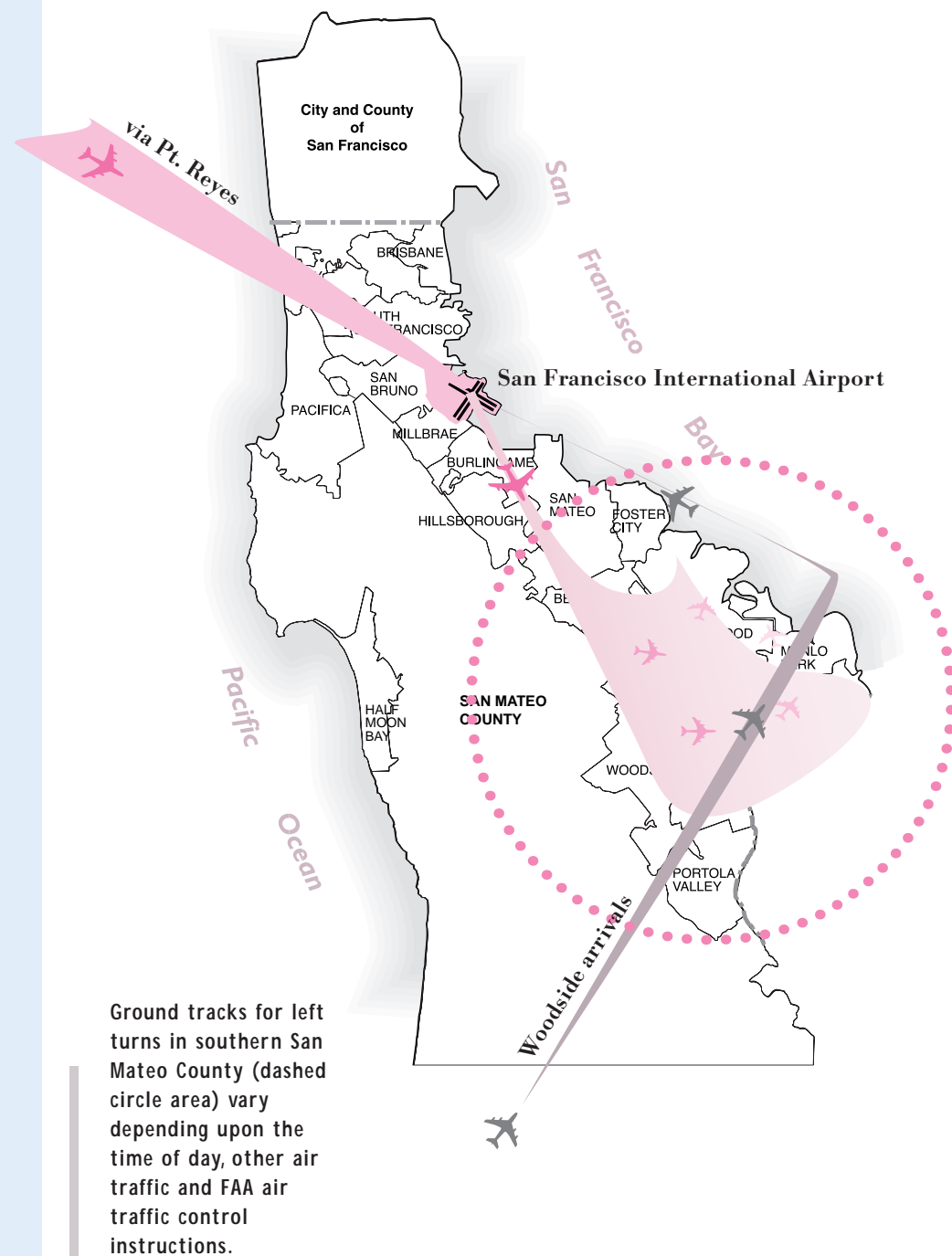
Pacific Rim arrivals cross the San Francisco Peninsula on a direct course to the Bay underneath southbound takeoffs from SFO or Oakland. This is an established approach presenting no problem early in the morning when departures are few.

Extended hours for this pattern would bring aircraft arriving via the Woodside VOR into the same area where southbound takeoffs are climbing out.

ATAC will model all traffic at all hours to spot where and when a conflict might arise.

The remaining three issues to be investigated are further increases in altitude over the Woodside VOR, elimination of "short-cut" routings over the Peninsula to Runways 28 and review of arrival procedures via Pt. Reyes.

ATAC modeling examines traffic



Ground tracks for left turns in southern San Mateo County (dashed circle area) vary depending upon the time of day, other air traffic and FAA air traffic control instructions.

Illustration Only • Drawing Not to Scale



A Roundtable Glossary

AIR CARRIER: An operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week and places between which such flights are performed; or (2) transport mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIR TAXI: An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally "for hire" for specific trips.

AIRPORT TRAFFIC CONTROL TOWER (ATCT): A central operations tower in the terminal air traffic control system with an associated IFR room if radar equipped, using air/ground communications and/or radar, visual signaling and other devices, to provide safe, expeditious movement of air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): A facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the enroute phase of flight.

APPROACH LIGHTING SYSTEM (ALS): An airport lighting facility which provides visual guidance radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach and landing.

AVONICS: Airborne navigation, communications, and data display equipment required for operation under specific air traffic control procedures.

BACKBLAST: Noise generated by jet exhaust on takeoff whose characteristic signature is high acoustic energy and low frequency. Also, high velocity air behind the aircraft engine.

BASE LEG: A flight path at right angles to the landing runway of its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL): A noise metric required by the California Airport Noise Standards for use by airport proprietors to measure aircraft noise levels. It describes average aircraft noise impacts at an airport and incorporates penalties for operations during the more sensitive evening and night-time

hours. This metric is only used in California; the other 49 states use Day/Night noise level (DNL).

COMMUTER AIRLINE: Operator of small aircraft (maximum size of 30 seats and 7,500-pound payload) performing scheduled service between two or more points.

dba: A unit for expressing the relative intensity of sounds (decibels) measured on the 'A' weighted scale; the 'A' weighted scale approximates human hearing.

DISPLACED THRESHOLD: A threshold that is located at a point on the runway other than the physical beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, slant range distance of an aircraft from the DME navigational aid.

DNL: Day-night noise level. The daily average noise metric in which that noise occurring between 10:00 p.m. and 7:00 a.m. is penalized by 10 times.

DOWNWIND LEG: A flight path parallel to the landing runway in the direction opposite the landing direction.

DURATION: Length of time, in seconds, a noise event such as an aircraft flyover is experienced. (May refer to the length of time a noise event exceeds a specified threshold noise level.)

FAR: Federal Aviation Regulations.

FAR PART 36: A Federal Aviation Regulation defining maximum noise emissions for aircraft.

FLEET MIX: The mix or differing types of aircraft operating in a particular environment.

GAP DEPARTURE: An aircraft departure via Runways 28 at San Francisco International Airport to the west over San Bruno, South San Francisco, Daly City and Pacifica.

GENERAL AVIATION (GA): That portion of civil aviation which encompasses all facets of aviation except air carriers holding a Certificate of Convenience and Necessity, large

aircraft commercial operators and military aircraft.

GLIDE SLOPE: Vertical guidance by reference to airborne instruments during instrument approaches such as an ILS, or visual ground aids, such as VASI, for a VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SATELLITE SYSTEM (GPS): A navigational system utilizing earth-orbiting satellites to provide non-precision guidance in azimuth, elevation, and distance measurement.

GROUND EFFECT: The excess attenuation attributed to absorption or reflection of noise by manmade or natural features on the ground surface.

GROUND TRACK: The seeming path an aircraft would follow on the ground if its airborne flight path were plotted on the terrain.

INSTRUMENT APPROACH: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR): Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

INSTRUMENT LANDING SYSTEM (ILS): Precision instrument approach system which normally consists of localizer, glide slope, outer marker, middle marker, and approach lights.

LOAD FACTOR: The percentage of seats filled in an aircraft.

LOCALIZER (LOC): A directional pattern of radio waves modulated by two signals which, when received with equal intensity, are displayed by compatible airborne equipment as an "on-course" indication, and when received in unequal intensity are displayed as an "off-course" indication.

LOCALIZER TYPE DIRECTIONAL AID (LDA): A facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.