August 2019

San Diego International Airport

Air Traffic Flight Procedure Evaluation

Prepared for:

San Diego County Regional Airport Authority

Prepared by:

RICONDO

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF APPENDICES

LIST OF TABLES

LIST OF EXHIBITS

THIS PAGE INTENTIONALLY LEFT BLANK

1. EXECUTIVE SUMMARY

The San Diego International Airport (SDIA or the Airport) Air Traffic Flight Procedure Evaluation (Flight Procedure Evaluation) was conducted in fulfillment of the San Diego County Regional Airport Authority's (the Authority's) action plan to evaluate the feasibility of the SDIA Airport Noise and Advisory Committee's (ANAC's) noise reduction recommendations related to published instrument flight procedures (flight procedures).[1] This report provides documentation related to the Flight Procedure Evaluation Team's (the Team's)[2] independent conceptual design and screening evaluation of the ANAC-proposed recommendations related to specific standard arrival and departure procedure overflights. The purpose of the Flight Procedure Evaluation was to determine the feasibility of conceptual standard instrument flight procedures intended to address the ANAC recommendations.

The analysis process involved three phases of conceptual design: Preliminary Draft Design Concept, Draft Design Concept, and Final Design Concept. In the Preliminary Draft Design Concept phase, initial design concepts were developed to satisfy the intent of the ANAC noise recommendations. Designs that did not meet the intent of ANAC recommendations, diminished safety, reduced airfield capacity, did not meet required Performance-Based Navigation (PBN)[3] Area Navigation (RNAV)[4] procedure design criteria, conflicted with existing air traffic regulations, and/or presented substantial operational hurdles were eliminated.

The Draft Design Concept phase included refinement and more detailed concept procedure design of the remaining recommendations or included a derivative of a recommendation that was eliminated in the Preliminary Draft Design Concept phase. Concepts that did not meet operational and PBN RNAV procedure design criteria and/or did not reflect the Federal Aviation Administration's (FAA's) mission and goals related to safe and efficient management of air traffic were eliminated. Recommendations and the related conceptual procedure designs that passed through the Draft Design Concept phase screening analysis were carried forward to the Final Design Concept phase.

With the safety, operational, and PBN RNAV procedure design criteria merits of each measure assessed in the first two phases, the Final Design Concept phase screening analysis was based on aircraft noise exposure. The results of the analysis were used to determine potential changes in Community Noise Equivalent Level[5] (CNEL) A-weighted decibel (dBA) noise exposure levels. Potential increases in CNEL levels were carefully considered to determine if the change would be consistent with FAA policy regarding noise exposure and noise abatement, and if the FAA would require additional environmental analysis and documentation.

The process involved coordination with the community, the aircraft operators, and the FAA Air Traffic Organization

[1] Flight procedure is a predefined set of guidance instructions that define a route for a pilot to follow.

[2] The Flight Procedure Evaluation Team consists of Ricondo & Associates, Inc. and Mead & Hunt, Inc.

[3] Performance-Based Navigation (PBN) is an advanced, satellite-enabled form of air navigation in the National Airspace System that creates precise 3-D flight paths. Procedures are based on the Area Navigation (RNAV) method of navigation and the precision requirements to ensure aircraft are within a set distance from the intended route (known as "lateral containment"). Performance requirements are based on the type of navigation (e.g., satellite or ground-based navigational aid), equipment on the aircraft, and pilot training.

[4] Area Navigation (RNAV) permits aircraft operation on any flight path within the coverage of referenced navigation aids, such as Global Positioning System (GPS) network, distance measuring equipment (DME), and/or very high omnidirectional radial (VOR). The method relies on navigational aids to provide the position of an aircraft both laterally and vertically.

[5] Community Noise Equivalent Level (CNEL) is the average sound level over a 24-hour period, with a penalty of 5 decibels (dBA) added between 7:00 p.m. and 9:59 p.m. and a penalty of 10 dBA added for the nighttime hours of 10:00 p.m. to 6:59 a.m.

(ATO) representatives to:

- Confirm the intent of each measure.
- Understand the current air traffic control (ATC) environment to determine concept procedure opportunities.
- Gather feedback on operational aspects of the procedure design concepts.
- Review and gather input on initial findings with community representatives and stakeholders.
- Modify design concepts to enhance feasibility.
- Evaluate potential changes to CNEL levels if feasible design concepts were implemented.
- Gather input on the results with community representatives and stakeholders.
- Recommend feasible procedure design concepts to the Authority for further consideration.

The Team designed and evaluated twenty unique flight procedure concepts throughout the process. The number of design concepts evaluated for each phase were as follows:

- Preliminary Draft Design Concept – Ten design concepts were developed and evaluated. Five were passed to the next phase, and five were eliminated from further consideration.
- Draft Design Concept – Fifteen design concepts were developed and evaluated. Six were passed to the next phase, three were forwarded to the Title 14 Code of Federal Regulations (CFR) Part 150 (14 CFR Part 150) process, and six were eliminated from further consideration.
- Final Design Concept – Six design concepts were refined and evaluated for potential changes in CNEL noise exposure. Based on ANAC recommendation intent, design criteria, noise modeling results and input from community representatives, the Team recommended three design concepts to the Authority and ANAC: ANAC Recommendation 14 Alternative 1 (Nighttime[6] jet departures-Fly By Turn at 1.5 NM from Shoreline, ANAC Recommendation 15 Alternative 2 (Nighttime jet departures-Fly By Turn at 1.5 NM from Shoreline then to ZZOOO Waypoint) and ANAC Recommendation 15 Alternative 1 (Daytime[7] jet departures- Extend JETTI Waypoint 2.0 NM West). Based on community input, the Team recommended to hold the nighttime jet departure design concepts from further consideration until the initial noise abatement departure path evaluation for ANAC Recommendations 17 and 21 are evaluated in the 14 CFR Part 150 process. The Team also recommended to proceed forward with the daytime jet departure design concept to extend the JETTI waypoint 2.0 NM further west for further consideration.

Based on the evaluation of ANAC Recommendations related to early turn compliance and noise dot locations (ANAC Recommendations 18, 19 and 20), the Team provided an independent definition of early turn compliance and concluded existing procedures and those recommended by the Team comply with the early turn restriction. The Team also recommended further consideration of locating Noise Dots 4 and 5 farther south to aid ATC in keeping eastbound jet departures south of the Point Loma Peninsula when ATC manages traffic using radar headings.

The following sections describe the project background, the analysis process, the findings related to each ANAC recommendation related to air traffic procedures, and the recommended conceptual designs for Authority consideration.

[6] Nighttime for the proposed procedures is between 10:00 p.m. and 6:30 a.m. There is a departure curfew between 11:30 p.m. and 6:30 a.m. If for any reason a departure occurs during the curfew, the flight is expected to be assigned the proposed procedure.

[7] Daytime for the proposed procedure is between 6:30 a.m. and 9:59 p.m.

2. BACKGROUND

Over the past several years, aircraft noise concerns have increased in communities surrounding SDIA, including Point Loma, Mission Beach, Ocean Beach, Pacific Beach, La Jolla, and East County. Many believe the concerns were a result of the FAA ATO's Southern California Metroplex (SoCal Metroplex) RNAV procedure implementation project. These concerns were presented and studied further as part of ANAC proceedings. The Authority relies upon the ANAC as a primary mechanism to coordinate aircraft noise issues. In accordance with Authority Board Policy 9.20, ANAC serves as a committee to the Authority Board and provides a forum for resident and community input and involvement on aircraft noise issues.

On October 18, 2017, ANAC requested the Authority staff to present 21 recommendations for noise reduction to the Authority Board. These recommendations were originally developed by the ANAC Subcommittee (Subcommittee) to address recent increased noise concerns in communities surrounding SDIA, including those related to the SoCal Metroplex RNAV flight procedures implemented in early 2017. In September 2016, the Subcommittee developed a work plan to guide its efforts over a 1-year term. Authority staff facilitated the Subcommittee's deliberations through 12 public technical meetings. The final deliverable of the Subcommittee's efforts was the 21 recommendations presented to ANAC in October 2017.[8]

Authority staff reviewed the ANAC recommendations between October 2017 and December 2017. The Authority staff developed an action plan to address the feasibility of each recommendation and, if applicable, how to implement it. The Authority staff divided the recommendations into two groups: Group A, those that can begin relatively quickly without significant technical analysis; and Group B, those that require substantial technical analysis with multiple stakeholders.[9] The ANAC recommendations in Group B were mainly focused on flight procedures and community requests for noise data. When reviewing the recommendations in Group B, Authority staff wanted to develop a plan that would maximize the ability for each recommendation to be implemented, if feasible, in a timely manner. Because these recommendations are generally under the purview of the FAA and require intensive analysis, technical consultation, and public involvement, Authority staff believed the most effective way to successfully pursue them would be to expedite a 14 CFR Part 150 study update. The FAA's established 14 CFR Part 150 study process is specifically designed to review and approve measures for purposes of 14 CFR Part 150 that demonstrate reduced noise impacts to communities, without shifting or creating new noise impacts. Recommendations that do not result in a noise reduction, or result in an increase of noise in other areas, may not be accepted by the FAA.

Several ANAC recommendations in Group B related to reducing noise levels below CNEL 65 dBA. Measures to reduce noise levels below CNEL 65 dBA are not typically considered by the FAA as acceptable measures under 14 CFR Part 150, unless a proposed procedure change is expected to reduce the number of people exposed to CNEL 65 dBA or

[8] San Diego County Regional Airport Authority, *Board Agenda and Meeting Materials – December 7, 2017*, "Item 15 - Action Plan for Addressing the Airport Noise Advisory Committee (ANAC) Recommendations," Exhibit A: Airport Noise Advisory Committee (ANAC) Sub-committee Recommendation (ANAC Approval), Approved, https://san.org/Airport-Authority/Meetings-Agendas?EntryId=9048 (accessed September 13, 2018).

[9] San Diego County Regional Airport Authority, *Board Agenda and Meeting Materials – December 7, 2017*, "Item 15 - Action Plan for Addressing the Airport Noise Advisory Committee (ANAC) Recommendations," https://san.org/Airport-Authority/Meetings-Agendas?EntryId=9048 (accessed September 13, 2018).

higher.[10] The Authority decided to initiate and conduct the Flight Procedure Evaluation to evaluate the ANAC recommendations focused on reducing noise levels below CNEL 65 dBA. This effort was conducted in parallel with the 14 CFR Part 150 study update process.

The intent of the Flight Procedure Evaluation effort was to identify conceptual flight procedure designs that met FAA design criteria, did not affect the safe and efficient movement of aircraft, and provided noise relief as intended by an ANAC recommendation. The effort conducted was similar to the efforts the FAA conducts as part of the first phase of its PBN Implementation Process, as described in FAA Order 7100.41A, *Performance Based Navigation Implementation Process* (FAA Order 7100.41A). The first phase of the FAA's process, called the Preliminary Activities phase, examines current operations, develops a concept, evaluates potential environmental issues, and determines expected benefits. Based on the information gathered in the first phase, the FAA would determine if the request should proceed through the development and implementation process based on the FAA's mission and goals. The Authority tasked Ricondo & Associates, to lead a consultant team with expertise in PBN RNAV procedure design (the Team) to assist in conducting the same type of efforts using the same toolsets the FAA uses as part of its process. The Authority relied upon stakeholder input from the Technical Advisory Committee (TAC) and the Citizen Advisory Committee (CAC) members to aid in identifying potential concerns and to ensure the proposed design concepts met the intent of a specific ANAC recommendation.

[10] CNEL 65 dBA is considered the FAA's compatibility threshold for residential land use. Residential areas exposed to CNEL 65 dBA or higher are considered incompatible, unless the residential unit was mitigated (e.g., sound insulation). Residential areas exposed to levels below CNEL 65 dBA are considered compatible.

3. FLIGHT PROCEDURE EVALUATION

Because this report often refers to ATC, it is important to understand the ATC requirements. **Appendix A** provides basic background information on the National Airspace System (NAS) and ATC. The information includes a description of the NAS, the role of ATC, the aircraft flow within the NAS, the type of ATC facilities, ATC requirements, and the FAA's Next Generation Air Transportation System (NextGen) program.

Eight ANAC recommendations in Group B were related to FAA air traffic procedures. The Flight Procedure Evaluation involved flight procedure design concepts and evaluation for three ANAC recommendations in Group B: ANAC Recommendations 14, 15, and 16. ANAC Recommendations 17 and 21 were expected to be evaluated as part of the 14 CFR Part 150 study process. ANAC Recommendations 17 and 21 involved conceptual changes to the initial departure heading from Runway 27, which would affect areas exposed to levels at or above CNEL 65 dBA. Three additional recommendations in Group B, ANAC Recommendations 18, 19, and 20, were related to traffic procedures, but did not involve flight procedure designs. Refer to Section 3.2.1 for more details related to each ANAC recommendation.

The Team conducted the evaluation on ANAC Recommendations 14, 15, and 16 using the same techniques applied by the FAA during the Preliminary Activities phase described in FAA Order 7100.41A. The primary tasks were as follows:

- Determine the justification for procedure based on intent of the ANAC recommendation.
- Become familiar with existing traffic flows, procedures, and airspace boundaries.
- Determine constraints related to safe and efficient movement of aircraft.
- Develop conceptual PBN RNAV procedures using the FAA's Terminal Area Route Generation Evaluation and Traffic Simulation (TARGETS) software, meeting the intent of the ANAC recommendations.
- Determine if a proposed change meets or conflicts with the FAA's goals and objectives.
- Evaluate potential benefits related to the justification for procedure.

The Team developed the RNAV procedures similar to the first phase detailed in FAA Order 7100.41A.[11] The Team did not have access to the safety data sources identified in the criteria, but it relied upon FAA Southern California Terminal Radar Approach Control (SCT TRACON) subject matter experts to provide input and feedback on the proposed concepts to qualitatively identify potential safety and air traffic management issues. The evaluation did not include an obstruction analysis, which would typically take place in the FAA's second phase, Design Activities. The designs developed for this evaluation are conceptual in nature and could be subject to change during the FAA's design process as a result of more detailed analysis, such as obstruction analysis, safety risk assessments, airline flight simulations, environmental screening assessments, flight check, charting, and/or additional stakeholder engagement and feedback.

The Team conducted the design in three phases: Preliminary Draft Design Concept, Draft Design Concept, and Final Design Concept. The phased approach provided stopping points to gather input from community members and stakeholders participating on the CAC and TAC. Stopping at each phase to review the concept designs served as a

[11] U.S. Department of Transportation, Federal Aviation Administration, Order 7100.41A, *Performance Based Navigation Implementation Process*, April 28, 2016.

means to ensure the Team's designs not only met the intent of the ANAC recommendations, but also identified potential issues related to safety, efficiency, operation procedures, aircraft capabilities, and land use compatibility. The Team gathered input from CAC and TAC members after each meeting and considered the input to determine potential refinements and, ultimately, a final design recommendation. **Appendix B** contains all the written input submitted by TAC and CAC members and the responses drafted by the Team throughout the process.

The following subsections provide more detailed information related to the Flight Procedure Evaluation process related to the roles and responsibilities for each stakeholder, the ANAC recommendations, and the flight procedure concept design constraints and requirements.

3.1 ROLES AND RESPONSIBILITIES

The Flight Procedure Evaluation process involved a diverse set of stakeholders with different roles, responsibilities, and interests in the outcomes of the evaluation. This section identifies the various key stakeholders and describes their roles and responsibilities.

3.1.1 SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

As the operator of SDIA, the Authority is the sponsor of the Flight Procedure Evaluation project and has the overall responsibility for the conduct of the evaluation. The Authority contracted the Team, developed the Scope of Work, and funded the evaluation. By virtue of its role on this evaluation, the Authority was the final decision-maker regarding all aspects of the project, including the execution of the project; the composition of the TAC and CAC; the flight procedure concepts to be included in the evaluation; and the appropriate direction to take related to next steps. The Authority will consider the Team's final recommendations and stakeholder input from TAC and CAC when deciding on an appropriate level of effort and the next steps at the conclusion of the evaluation.

The Authority does not have legal authority to regulate air traffic procedures. Through federal law, Congress has essentially preempted airports, states, and local governments from regulating (a) the price, route, and service of air carriers; (b) the use of airspace and airspace management; and (c) aircraft noise. These laws are as follows: Federal Aviation Act of 1958, as amended (Pub. L. No. 85-726, 72 Stat. 731 49 U.S.C., § 0103[b][1]&[2]); Noise Control Act of 1972 (49 U.S.C. §§ 44709, 44715); Airline Deregulation Act of 1978 (ADA; 49 U.S.C. 41713[b]); Airport Noise & Capacity Act of 1990 (ANCA; 49 U.S.C. § 47521 et. seq; 14 Code of Federal Regulations Part 161); and Aviation Safety & Noise Abatement Act of 1979 (ANSA; 49 U.S.C. § 40116, 46505, 47501 et seq.).

"Federal preemption" is a legal concept based on the Supremacy Clause in the U.S. Constitution (Article VI, Clause 2). It applies when Congress evidences an intention to exercise broad federal control in a particular area. Today, airports are preempted from controlling or regulating aircraft in flight, regulating early turns, mandating departure headings or altitude, restricting access to an airport based on aircraft type, and adopting noise curfews. SDIA, however, is one of a few unique airports in the United States that operates with a night noise curfew (no departures between 11:30 p.m. and 6:30 a.m.), because its curfew was adopted prior to the passage of ANCA in 1990; therefore, the Airport is grandfathered by law.

Under the federal laws previously cited, Congress has vested the U.S. Department of Transportation (U.S. DOT), FAA with the plenary power to regulate aircraft, as well as the use of airspace, departure headings, aircraft altitudes, air carrier routes, airline services, aircraft noise, aircraft safety, and more.

3.1.2 TECHNICAL ADVISORY COMMITTEE

The Authority began the formation of the 14 CFR Part 150 study process at the same time the Flight Procedure Evaluation was being conducted. Experience has shown that most 14 CFR Part 150 studies benefit from the creation and participation of a TAC. The Authority determined the input from TAC on the Flight Procedure Evaluation would also be beneficial. The TAC served several important functions: representing a broader range of stakeholder groups and interested constituents; receiving information about the evaluation and sharing it with the larger group and/or constituents; providing input to the evaluation; and, in some cases, providing technical advice to the Authority and Team.

For the TAC to be effective and to represent all key stakeholders involved in aircraft operations and noise issues, the TAC was composed of a diverse group, including community representatives, aircraft operators/airlines, affected jurisdictions, and land use planners. While representation was broad, the TAC was a reasonable size so that meetings and deliberations were efficient. The Authority identified potential members to serve the TAC that represented noise concerns at levels at or above CNEL 65 dBA and areas exposed to CNEL levels below 65 dBA. The Authority provided two seats for CAC representatives and two seats for ANAC representation. The Authority also reached out to multiple airlines and corporate general aviation operators. Representatives of the Authority and local land use jurisdictions were also included. By virtue of its role as technical advisor during the evaluation and as the approval authority related to air traffic matters, the FAA served as an observing member of the TAC. Although the FAA did not provide input at the meetings, the FAA provided access to SCT TRACON subject matter experts to gather input on proposed design concepts.

It is important to note the TAC is advisory only to the Flight Procedure Evaluation; the TAC could offer opinions, advice, and guidance, but the Authority had the sole discretion to accept or reject the TAC recommendations in accordance with FAA air traffic regulations, procedure design criteria, and other constraints described in Section 3.2.2, which were shared and discussed with TAC at the beginning of the process.

3.1.3 CITIZEN ADVISORY COMMITTEE

One of the most significant concerns raised at the October 18, 2017, ANAC meeting was the continuation of the Subcommittee (ANAC Recommendation 3). Authority staff recommended the continuation of the Subcommittee be accomplished through the establishment of a CAC that would work alongside the TAC during the 14 CFR Part 150 study update process. The CAC was established and held its first meeting on March 22, 2018.

The Authority also determined input from CAC on the Flight Procedure Evaluation would be critical and beneficial to the process. The primary role for the CAC was to advise the Authority and TAC on the intent for each ANAC recommendation under evaluation and to communicate new noise considerations during the process. The Authority relied upon CAC members to represent the interests and concerns of the communities they represented and to communicate information shared at meetings with interested parties in their communities.

The Authority announced the intent to form a CAC and requested interested parties to apply for participation. The Authority evaluated over 40 applications for 15 CAC seats and selected applicants to ensure fair representation around SDIA related to existing aircraft noise exposure and current overflight concerns. Individuals were selected based on location, previous involvement in noise processes at SAN, and knowledge of aviation.

The CAC role to the Flight Procedure Evaluation is advisory only; the CAC could offer opinions, advice, and guidance, but the Authority had the sole discretion to accept or reject the CAC recommendations in accordance with FAA air traffic regulations, procedure design criteria, and other requirements described in Section 3.2.2, which were shared

and discussed with CAC at the beginning of the process. Two CAC members selected by CAC served on the TAC; their responsibility was to represent CAC input and to advise the TAC regarding the ANAC recommendations and any new noise considerations.

3.1.4 FEDERAL AVIATION ADMINISTRATION AIR TRAFFIC ORGANIZATION

The FAA's role related to air traffic and airspace management is summarized in FAA Job Order (JO) 7100.2L, *Procedures for Handling Airspace Matters*: "The navigable airspace is a limited national resource that Congress has charged the Federal Aviation Administration (FAA) to administer in the public interest as necessary to ensure the safety of aircraft and its efficient use."[12] Authorized by Congress, the FAA has legal authority to regulate matters related to airspace use, air traffic management, and air traffic procedures. The FAA ATO was regulated to handle all matters related to airspace and air traffic.

The FAA ATO agreed to provide the Authority with ongoing assistance on this evaluation in a technical advisory role. The FAA provided an ex-officio representative to be present at the TAC meetings; this representative was available to meet with the Authority and the Team as needed to provide subject-matter-expert general input on proposed design concepts. If the Authority decides to submit proposed concepts to the FAA ATO for consideration, then the FAA will conduct its internal process described in FAA Order 7100.41A. The FAA has sole authority to determine if a proposed measure is considered "feasible." The FAA would begin a formal process of review after a proposed procedure is submitted by a project sponsor.

3.1.5 MEMBERS OF THE PUBLIC

Members of the general public were encouraged to stay abreast of the evaluation progress by visiting the Authority's website, which included all the presentations provided to the CAC and TAC.. CAC and TAC meetings were open to the general public; members of the general public could attend as observers only and were encouraged to speak to their local CAC and TAC representative.

3.2 DEFINE REQUIREMENTS

The Flight Procedure Evaluation process is guided by two primary requirements: (1) meet the intent of an ANAC recommendation; and (2) be feasible to advance through the first step in the FAA ATO's PBN implementation process. The following subsections summarize the flight procedure–related ANAC recommendations and the intent for each, as well as the concept development parameters used to consider feasibility.

3.2.1 ANAC RECOMMENDATIONS

On October 18, 2017, ANAC requested that Authority staff present 21 recommendations to the Authority Board. These recommendations were originally developed by the Subcommittee to address recent increased noise concerns in communities surrounding SDIA, including those related to the implemented RNAV flight procedures. Starting in September 2016, the Subcommittee developed a work plan to guide its efforts for its 1-year term. Authority staff facilitated the Subcommittee's deliberations through 12 public technical meetings. The final deliverable of the Subcommittee's efforts was the 21 recommendations presented to ANAC in October 2017.

The intent of this Flight Procedure Evaluation was to evaluate only the ANAC recommendations related to flight procedures. The evaluation effort was to identify flight procedure design concepts that met FAA design criteria, did

[12] U.S. Department of Transportation, Federal Aviation Administration, Job Order 7400.1L, Changes 1 and 2, *Procedures for Handling Airspace Matters*, https://www.faa.gov/documentLibrary/media/Order/7400.2L_Bsc_w_Chgs_1-2_dtd_3-29-18.pdf (accessed September 5, 2018).

not adversely affect the safe and efficient movement of aircraft, and met the intent of an ANAC recommendation. The Team identified flight procedure–related ANAC recommendations and confirmed the selection and intent with the CAC and TAC at the first meetings on March 22, 2018, and April 5, 2018, respectively. **Table 3-1** describes each flight procedure–related ANAC recommendation, as presented to the Authority by ANAC.

As previously discussed, eight ANAC recommendations were related to flight procedures. The Flight Procedure Evaluation focused on flight procedure design concepts for ANAC Recommendations 14, 15, and 16. ANAC Recommendations 17 and 21 were expected to be evaluated as part of the 14 CFR Part 150 study process, because it involves conceptual changes to the initial departure heading from Runway 27, which would affect areas exposed to levels at or above CNEL 65 dBA. ANAC Recommendations 18, 19, and 20 were related to traffic procedures, but they did not involve flight procedure designs.

ANAC Recommendation 18 sought to define an "early turn" for departures from Runway 27. The definition of an "early turn" was applied when evaluating concept designs for ANAC Recommendations 14 and 15. The intent of ANAC Recommendation 19, which sought to modify procedures to reduce early turns based on the definition derived for Recommendation 18, was considered as part of the overall intent for ANAC Recommendations 14 and 15. ANAC Recommendation 20 did not proceed forward as a component of flight procedure design, because the existing procedures and proposed design concepts do not compromise the "early turn" restriction and can be monitored for compliance based on use of a procedure. For more information about the Team's evaluation on ANAC Recommendations 18, 19, and 20, refer to the Team's report *Review and Analysis of: Airport Noise Advisory Committee Recommendations 18, 19, and 20*, dated March 2019 in **Appendix C**. Section 7 provides a summary of the Team's findings related to ANAC Recommendations 18, 19 and 20.

3.2.2 CONCEPT DEVELOPMENT PARAMETERS

Multiple design parameters were applied to create viable flight procedure concepts that would follow FAA ATO safety, efficiency, and environmental requirements. The general parameters were:

- do not reduce safety
- do not reduce capacity of SDIA
- do not change aircraft flight paths[13] over areas exposed to CNEL at or higher than 65 dBA
- meet FAA PBN procedure design criteria
- fit within existing airspace boundaries
- be sensitive to moving noise to new noncompatible areas to reduce noise over a community

Table 3-2 presents additional information related to each parameter.

[13] FAA standard procedures refer to a line between two fix points (e.g., waypoints, fixes, or NAVAIDS) as a "route." FAA standard procedure plates depict the defined route. Procedure design may not translate to an aircraft located exactly on the route, especially if the route involves turns. For purposes of this evaluation, the expected location of an aircraft on a standard procedure is referred to as a "path." Differences between the definitions for "route" and "path" are applied to avoid confusion between the FAA's definition of a route and where aircraft are expected to be located.

TABLE 3-1(1 OF 2) AIRPORT NOISE ADVISORY COMMITTEE (ANAC) SUBCOMMITTEE RECOMMENDATIONS APPROVED BY ANAC

ANAC RECOMMENDATION NUMBER	DESCRIPTION
ANAC 14	**Revise PADRZ SID or create a new procedure to reduce increased noise in La Jolla, Mission Beach and Pacific Beach**
	Procedure Suggestions:
	▪ Move the WNFLD and LANDN waypoints due south so as to align with the relocated Noise Dot #1 at 290° (15° separation from JETTI at 275°) and designate as "Flyover" waypoints in their respective SID's, consistent with JETTI.
	▪ Establish within the PADRZ SID procedure a horizontal distance from end of runway (1.0 miles) along a fixed heading which must be satisfied along with altitude before a right turn can be initiated to preclude flights that quickly attain the current 520' altitude and turn right of and prior to Noise Dot #1 before correcting to WYNFLD which results in aircraft flying farther north over Mission Beach.
	▪ PADRZ ONE SID As currently designed the PADRZ ONE departure leaves aircraft very close to and almost paralleling the coast along La Jolla, increasing noise impacts significantly. We recommend moving the WNFLD and KERNL waypoints 1.5NM south of their current positions. This will ensure aircraft proceed more directly off the coast without paralleling the shore and adds less than a mile of track distance to PADRZ.
	▪ Create a new procedure: BROCK-1 (alternative 1) Request FAA to revise PADRZ SID and establish new waypoint BROCK1. Adds min increased flight time and takes aircraft further offshore before turning to northern destinations. This will help all coastal neighborhoods with noise issues.
	▪ Create a new procedure: BROCK-2 (alternative 2 - preferred) Relocate Waypoints WNFLD and LANDN 0.75 miles directly south or adopt BROCK recommendation. Maintain 274 Departure until Altitude 520 or greater. Maintain 274 departure heading until 520-foot altitude or greater and the aircraft have reached (new) flyover waypoint 0.25 to 0.5 miles from the end of the runway before turning towards WNFLD, LANDN or new BROCK Waypoint.
	▪ Do not move the PADRZ SID further south to avoid negative noise impacts on the south side communities of the Point Loma Peninsula
ANAC 15	**Revise ZZOOO to significantly reduce or eliminate flights over the Point Loma Peninsula, including Cabrillo National Park and reduce or eliminate eastbound turns over La Jolla.**
	Procedure Suggestions
	▪ East bound flights should reach a minimum of 8K feet before crossing over ZZOOO to minimize thrusters and reduce duration of noise impacts over Point Loma.
	▪ FAA\TRACON to discourage the practice of redirecting flights off of their filed ZZOOO flight plan departure, to turn north then east over La Jolla. FAA to increase minimum SID flyover\flyby altitudes to encourage increased climb rates.
	▪ FAA\TRACON to direct that ALL SAN departure separation be limited to between JETTI (275°) and the historical Red Noise Dot #1 (290° vectors from the end of runway 27) for LNSAY, BORDER, PEBLE and ZZOOO, etc. (plus all new Metroplex SID's); Prohibit 250° to 275° departure vector range, except for specific safety events ("Runway 27 STAR Missed Approach Wave Off").
	▪ Follow ZZOOO procedure, comply with the JETTI flyover waypoint and consider the establishment of a minimum vectoring altitude for Eastbound turns
	▪ The ZZOOO ONE departure as currently designed puts departing aircraft to close to the Point Loma peninsula and the southern end of coastal La Jolla, subjecting residents to increased and at times incessant noise from departing aircraft. Aircraft need to be further offshore before beginning the turn south to the ZZOOO waypoint. We recommend replacing the JETTI waypoint with a waypoint along the same track from the departure end of runway 27 that is 2 NM further west, located at approximately 32.75360N -117.25755W.

TABLE 3-1(2 OF 2) AIRPORT NOISE ADVISORY COMMITTEE (ANAC) SUBCOMMITTEE RECOMMENDATIONS APPROVED BY ANAC

ANAC RECOMMENDATION NUMBER	DESCRIPTION
ANAC 16	**Reassess and revise the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the North in a very narrow corridor.**
	Procedure Suggestions
	▪ Revise COMIX STAR procedure in order to shift flights that Metroplex has moved and concentrated farther South (the downwind leg) over less populated areas and restore prior altitude.
	▪ Shift the way point XMANS on the COMIX STAR north to a location that is over the interstate freeway 805 and 52 with the constraint to remain clear of MCAS Miramar's airspace. It would come ashore over Torrey Pines State Park before connecting with KLOMN
	▪ Increase Min. Altitude at LNTRN (LCOVE) at or above 10,000. This change would result in aircraft flying over less populated areas, including industrial businesses, thus reducing the noise impact and saving time/fuel. This proposed path is closer to the historical flight tracks pre-NextGen
	▪ COMIX ONE STAR: The RNAV-only COMIX ONE arrival is very similar to the existing non-RNAV BAYVU arrival in terms of ground track with a key difference being that the COMIX arrival has an "at or above 8,000 feet" altitude restriction on its last offshore waypoint (LANTRN). The BAYVU arrival has an "at or above 9,000 feet" restriction at its nearly identically-located LCOVE waypoint. This has resulted in aircraft being lower and noisier over La Jolla. We recommend changing the LANTRN waypoint's altitude restriction to "at or above 9,000 feet".
ANAC 17	**Determine methods to increase current compliance in Nighttime Noise Abatement Procedures to improve noise impacts for affected communities and ensure that ATC is only turning aircraft off this procedure for safety reasons only.**
ANAC 18	**Review if the current definition of an early turn, define what an early turn means and conduct comparative analysis to actual flight paths**
ANAC 19	**Work with FAA/ATC to modify flight procedures to increase compliance and reduce early turns, with consideration of aircraft performance**
ANAC 20	**FAA\TRACON to incorporate Red Dot waypoint locations into current and future SID's as part of the formal SID and STAR Procedures, so that Red Dots become waypoints on departure procedures and data is collected on waypoints.**
	Suggestions
	▪ Reposition FAA Noise Dot #1 from its current position at 295 degrees (implemented by FAA\AA without public notice) to its "original" pre-2005 position at 290 degrees from end of SAN Runway 27 and 1.5 miles off of the coast
	▪ Reposition FAA Noise Dot #3 from its current position at 265 degrees (implemented by FAA\AA without public notice) to its "original" pre-2005 position of 275 degrees (JETTI) and 1.5 miles off of the coast
	▪ Reposition FAA Noise Dot #4 from its current location (west of Fort Rosecrans) to coincide with the ZZOOO waypoint to deter regular Early left turns inside of ZZOOO which continue to occur at the direction of ATC in direct conflict with the SID routing. ZZOOO was specifically designed by FAA to provide an efficient and cost effective departure for eastbound traffic and to mitigate impacts to affected DOT Section 4(f) recourses (including Fort Rosecrans, Cabrillo National Monument) and the peninsula community
ANAC 21	**Have SDCRAA conduct an engineering analysis of modification to the Noise Abatement Departure Procedure to assess the potential improvement to noise contours around the airport.**

SOURCE: San Diego County Regional Airport Authority, *Board Agenda and Meeting Materials – December 7, 2017*, "Item 15 - Action Plan for Addressing the Airport Noise Advisory Committee (ANAC) Recommendations," Exhibit A: Airport Noise Advisory Committee (ANAC) Sub-committee Recommendation (ANAC Approval), Approved, https://san.org/Airport-Authority/Meetings-Agendas?EntryId=9048 (accessed September 13, 2018).

TABLE 3-2 (1 OF 2) CONCEPT DEVELOPMENT PARAMETERS DESCRIPTION

PARAMETER	DESCRIPTION	OUTSIDE OF PARAMETER EXAMPLES	APPLICABLE FAA ORDERS AND GUIDANCE
Do not reduce safety	The primary purpose of the air traffic control system is to prevent the collision of aircraft operating in the system. The priority of an Air Traffic Controller is the safe separation of aircraft. Air traffic regulations and procedure design criteria are developed to provide a high level of safety. Any proposed changes to a procedure that do not meet air traffic regulations (e.g., aircraft separation), procedure design criteria, and/or obstruction clearance can cause safety risks, which would reduce the feasibility of a proposed concept.	▪ A procedure that does not provide 3.0 nautical miles (NM) lateral separation and/or 1,000 feet mean sea level (MSL) vertically from another procedure. ▪ A procedure that requires a descent or climb rate above maximum levels stated in procedure design criteria and/or requires all available means by pilots to descend and slow down at the same time (e.g., use of speed brakes). ▪ A procedure that converges or conflicts with another procedure. ▪ Two procedures sharing a common route but designed differently. ▪ A procedure design that creates a new safety risk.	▪ Federal Aviation Administration (FAA) Order 7110.65, *Air Traffic Control* ▪ FAA Order 7210.56C, *Air Traffic Quality Assurance* ▪ FAA Order 8040.4, *Safety Risk Management Policy* ▪ FAA Order 8260.19, *Flight Procedures and Airspace* ▪ FAA Order 8260.3, *United States Standard for Terminal Instrument Procedures (TERPS)* ▪ FAA Order 8260.46, *Departure Procedure (DP) Program* ▪ FAA Order 8260.52, *United States Standard for Required Navigation Performance (RNP) Approach Procedures with Special Aircraft and Aircrew Authorization Required (SAAR)* ▪ FAA Order 8260.58, *United States Standard for Performance Based Navigation (PBN) Instrument Procedure Design*
Do not reduce SDIA capacity	San Diego International Airport's (SDIA's) airfield acceptance rate for departures and arrivals shall not be impacted by any proposed procedure concepts.	▪ A procedure design that requires all Runway 27 departures to take off on one heading instead of two divergent headings will reduce the acceptance rate for departures per hour.	▪ FAA Order 7110.65, *Air Traffic Control*
Do not change flight paths over areas exposed to CNEL 65 dBA or higher	A change in noise exposure for areas exposed to levels at or higher than Community Noise Exposure Level (CNEL) 65 decibels (dB) can be considered a significant impact, depending on the degree of change; this can also create potential land use compatibility impacts. Such impacts could require an Environmental Impact Statement (EIS) and could cause significant extraordinary circumstances, such as public controversy. This substantially impacts the feasibility of a proposed concept, and any such action should be evaluated as part of the Title 14 Code of Federal Regulations (CFR) Part 150 study process.	▪ A change to initial departure headings from Runway 9 or Runway 27.	▪ FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* ▪ FAA Order 7400.1L, *Procedures for Handling Airspace Matters*, Chapter 32, "Environmental Matters"
Meet FAA PBN procedure design criteria	All concept procedures must meet PBN design criterial requirements, as documented in FAA Orders and guidelines.	▪ Flyability failures based on the FAA's Terminal Area Route Generation Evaluation and Traffic Simulation (TARGETS) PBN procedure design tool. ▪ Distance requirements between two waypoints based on route geometry (e.g., 180-degree turns). ▪ Exceeding maximum descent rates or climb rates.	▪ FAA Order 8260.58, *United States Standard for Performance Based Navigation (PBN) Instrument Procedure Design* ▪ FAA Order 8260.3, *United States Standard for Terminal Instrument Procedures (TERPS)*

TABLE 3-2 (2 OF 2) CONCEPT DEVELOPMENT PARAMETERS DESCRIPTION

PARAMETER	DESCRIPTION	OUTSIDE OF PARAMETER EXAMPLES	APPLICABLE FAA ORDERS AND GUIDANCE
Fit within existing airspace boundaries	Controlled airspace is managed by breaking up the airspace into multiple sectors assigned to an air traffic controller. Every effort should be made to ensure procedure concepts do not require a change in sector boundaries; keep aircraft within the appropriate sector; and stay at least 1.5 NM laterally and/or 1,000 feet MSL vertically from neighboring sector boundaries to ensure safe separation. In addition, SDIA operations must stay within the Class B airspace.[1] All procedure concepts must ensure SDIA operations stay within the controlled Class B airspace boundaries.	▪ A procedure that leaves the Class B boundary. ▪ A procedure design that is within 1.5 NM from a neighboring air traffic control sector. ▪ A procedure design that changes location where an air traffic controller transitions control over to another air traffic controller.	▪ FAA Order 7110.65, *Air Traffic Control* ▪ Standard Operating Procedures for Los Angles Air Route Air Traffic Control Center (ZLA ARTCC) ▪ Standard Operating Procedures for Southern California Terminal Radar Approach Control (SCT TRACON) ▪ Letter of Agreements between SCT TRACON and ZLA ARTCC
Be sensitive to moving noise to new noncompatible areas to reduce noise over a community	If the purpose and need of a procedure design is to reduce noise over a community, then every effort should be made not to cause an increase in noise for other communities, especially those not represented by the Citizen Advisory Committee (CAC), or cause other environmental impacts as a result of moving a procedure, unless the affected communities are informed of the change and potential impacts.	▪ A PBN procedure design moved over communities that do not have a PBN procedure over the community causes a reportable and/or noticeable change in aircraft noise exposure.	▪ Environmental considerations: FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Section 4(f) resources: historic properties; environmental justice and/or extraordinary circumstances. ▪ FAA Top Policy Issues: "FAA Authority regarding Noise: While the FAA has the authority to alter flight procedures based on noise, the Agency historically has not exercised that authority to prohibit aircraft flights over a particular area unless the operation is unsafe, or the aircraft is operated in a manner inconsistent with FAA regulations. This is because flight procedure changes can result in shifting of aircraft noise from one community to another. Any work regarding the movement of procedures is done for safety and efficiency reasons (including enhancing controller ability to monitor traffic)."[2]

NOTES:

1 Class B airspace is designated airspace from the surface to 10,000 feet MSL surrounding a busy airport, such as SDIA, in terms of airport operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored, consists of a surface area and two or more layers, and is designed to contain all published instrument flight procedures once an aircraft enters the airspace. Air Traffic Control clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace

2 U.S. Department of Transportation, Federal Aviation Administration, FAA Top Policy Issues, https://www.transportation.gov/transition/FAA/Top-Policy-Issues (accessed September 11, 2018).

SOURCE: Ricondo & Associates, Inc., September 2018.

3.2.3 FEDERAL AVIATION ADMINISTRATION MISSION AND GOALS

The primary objective of the Flight Procedure Evaluation was to identify conceptual procedure designs that had a likelihood of advancing through the FAA's first phase of the PBN Procedure implementation process, as described in FAA Order 7100.1A. The first phase in the FAA process, called the Preliminary Activities phase, examines current operations, develops a concept, evaluates potential environmental issues, and determines expected benefits. Based on the information gathered in the first phase, the FAA would determine if the request should proceed through the development and implementation process based on the FAA's mission and goals. FAA Order 7100.41A does not describe the FAA's mission and goals. The Team evaluated publicly available information to qualify the FAA's mission and goals and considered the information during the evaluation process. The following information describes the Team's findings related to the FAA's mission and the organizational process it uses to achieve its ultimate mission.

The FAA's mission is to "to provide the safest, most efficient aerospace system in the world."[14] In all lines of business within the FAA, the primary mission is at the forefront. This holds true related to air traffic procedures and noise abatement, as described in 14 CFR Part 150.35, paragraph (b)(3). This is consistent with 14 CFR Part 150.35 paragraph (b)(3), which states:

> "Those aspects of programs relating to the use of flight procedures for noise control can be implemented within the period covered by the program and without—
>
> (i) Reducing the level of aviation safety provided;
>
> (ii) Derogating the requisite level of protection for aircraft, their occupants and persons and property on the ground;
>
> (iii) Adversely affecting the efficient use and management of the Navigable Airspace and Air Traffic Control Systems; or
>
> (iv) Adversely affecting any other powers and responsibilities of the Administrator prescribed by law or any other program, standard, or requirement established in accordance with law."[15]

The FAA's vision, which drives the goals or strategic initiatives identified by the FAA, states: "We strive to reach the next level of safety, efficiency, environmental responsibility and global leadership. We are accountable to the American public and our stakeholders."[16] Therefore, the FAA would evaluate a proposed procedure change to determine if a proposed procedure not only causes an adverse impact on the safe and/or efficient use of the navigable airspace, but also hinders its ability to further enhance the safe and efficient movement of aircraft. For example, the FAA is implementing PBN RNAV procedures to enhance the safe and efficient movement of aircraft, and any proposed change that removes or reduces the safety and efficiency gained by the implemented procedure would most likely be considered not meeting the FAA's goals. As a result, the likelihood of the FAA rejecting the proposed change would be high.

[14] U.S. Department of Transportation, Federal Aviation Administration, "Mission," April 23, 2010, https://www.faa.gov/about/mission/ (accessed September 11, 2018).

[15] 14 CFR 150.35

[16] U.S. Department of Transportation, Federal Aviation Administration, "Mission," April 23, 2010, https://www.faa.gov/about/mission/ (accessed September 11, 2018).

3.2.4 CITIZEN ADVISORY COMMITTEE AND TECHNICAL ADVISORY COMMITTEE INPUT ON DESIGN AND EVALUATION PROCESS

The Team presented the ANAC recommendations and concept development parameters at the first CAC and TAC meetings held on March 22, 2018, and April 5, 2018, respectively. The primary focus of the meeting was to educate TAC and CAC members on the related ANAC recommendations and the intent for each one. The CAC confirmed the Team's selection of ANAC recommendations related to flight procedures and the Team's understanding of the intent of each recommendation. The Team described the process planned for the Flight Procedure Evaluation with an emphasis on the intent of the process to identify feasible flight procedure concepts. The process did not represent the FAA ATO's PBN implementation process. CAC members inquired about the FAA's role in the process, examples that impact SDIA capacity, and other ANAC recommendations. The Team emphasized the FAA's role as ex-officio while at TAC meetings, but it would provide access to subject matter experts as needed. The Team provided example procedure changes that could impact SDIA capacity, as well as examples that could impact areas exposed to CNEL 65 dBA or higher (refer to Table 3-2 for examples). The Authority provided an overview of the 14 CFR Part 150 study process, in which ANAC recommendations that can affect the CNEL 65 dBA exposure area will be evaluated.

4. PRELIMINARY DRAFT DESIGN CONCEPTS

ANAC Recommendations 14, 15, and 16 were the focus of the procedure design concept process. ANAC Recommendations 17 and 21 will be evaluated in the 14 CFR Part 150 Study. A description of the evaluation of ANAC Recommendations 18,19, and 20 is provided in Appendix C.

As discussed in Section 3, the Team conducted a three-phase process: Preliminary Draft Design Concept, Draft Design Concept, and Final Design Concept. The Preliminary Draft Design Concept phase involved four steps:

1. Conduct a baseline review of the existing air traffic environment around SDIA with FAA SCT TRACON and confirm any potential near-term changes to flight procedures.
2. Conduct an initial review of the procedure suggestions provided by the ANAC Subcommittee (Table 3-1) to determine if suggestions are viable based on design parameters (Table 3-2).
3. Develop and design conceptual procedures using the FAA's TARGETS software for suggestions deemed viable and/or concept(s) that meet the intent of the ANAC recommendation.
4. Review and gather input from CAC and TAC on initial review findings and preliminary draft concepts to determine if adjustments are required and concepts meet the intent of the associated ANAC recommendation.

The following subsections summarize the results for each of the four steps.

4.1 FEDERAL AVIATION ADMINISTRATION AIR TRAFFIC ENVIRONMENT – BASELINE REVIEW

On April 17, 2018, the Team met with FAA ATO and SCT TRACON subject matter experts to provide the FAA an overview of the ANAC recommendations, to confirm known near-term amendments or changes to existing flight procedures, and to seek feedback from the FAA on any operational considerations related to the procedures subject for review for the Flight Procedure Evaluation. The FAA provided input related to key air traffic management requirements, such as safe minimum separation standards, and shared concerns with maintaining efficiencies gained as a result of the implemented PBN RNAV procedures. The FAA indicated willingness to provide feedback as requested during the process and remained open to feasible concepts that have a potential to reduce noise while not impacting the safe and efficient movement of traffic within the SCT TRACON airspace. SCT TRACON subject matter experts provided the Team with an overview of their standard operating procedures related to areas where traffic assigned to the ZZOOO RNAV Standard Instrument Departure (SID),[17] PADRZ RNAV SID, and COMIX RNAV Standard Terminal Arrival Route (STAR)[18] are managed by air traffic controllers, and they answered questions related

[17] Standard Instrument Departure – a published instrument departure procedure that provides pilots with defined lateral and vertical guidance to facilitate safe and predictable navigation from an airport through the terminal airspace to a specific high-altitude route in the enroute airspace. A "conventional" SID follows a route between two points defined by ground-based NAVAIDs, and/or it may be based on air traffic controller–issued headings or vectoring. An RNAV SID defines a more predictable path through the airspace than a conventional SID through the combination of GPS and aircraft Flight Management Systems (aircraft auto-pilot or flight path guidance on screen).

[18] Standard Terminal Arrival Route – a published instrument arrival procedure that provides pilots with defined lateral and vertical guidance to facilitate safe and predictable navigation from a specific high-altitude route in the enroute airspace through the terminal airspace to an airport. A "conventional" STAR follows a route between two points defined by ground-based NAVAIDs, and/or it may be based on air traffic controller–issued headings or vectoring. An RNAV STAR defines a more predictable path through the airspace than a conventional STAR through the combination of GPS and aircraft Flight Management Systems (aircraft auto-pilot or flight path guidance on screen).

to traffic patterns that diverge from the defined SID and STAR published flight paths. As a result of the information provided at the meeting, the Team was able to formulate a good understanding of the current air traffic environment related to SDIA Runway 27 departures and arrivals from the north/northwest to Runway 27.

4.2 INITIAL REVIEW OF ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS

The Team reviewed the ANAC Subcommittee procedure suggestions for Recommendations 14, 15, and 16 to determine if a design concept could meet the design parameters. If a suggestion met the parameters, then the Team maintained the suggestion for concept design. If not, then the Team documented and provided reasons to TAC and CAC why a suggestion did not meet the design parameters. If a suggestion did not meet the design parameters, then the Team evaluated potential modifications to the suggestion to meet the parameters, if possible.

Table 4-1 summarizes the Team's conclusions related to the ANAC Subcommittee's suggestions.

4.3 PRELIMINARY DRAFT DESIGN CONCEPT SUMMARY

The Team evaluated ten alternative design concepts in the Preliminary Draft Design Concept phase based on initial review of ANAC recommended alternative concepts and suggestions. **Table 4-2** lists alternative design concepts by ANAC recommendation and indicates the Team's findings based on the criteria described in Section 3.2.2. Table 4-2 includes criteria categories to identify the reason(s) why an alternative concept should not be carried forward to the next phase. If a recommendation was eliminated from further consideration, then proposed design changes were considered based on input from TAC and CAC regarding potential alterations to the original recommendations. **Appendix D** includes procedure design sheets for each alternative design concept evaluated by the Team. Additional information related to each procedure design is included on each procedure design sheet.

Of the ten concepts evaluated, five were passed to the next phase and five were eliminated from further consideration. Of the five eliminated, three were eliminated based on TAC and CAC input related to meeting the intent of Recommendation 16. Two were eliminated based on safety, design, and CNEL 65 dBA parameters.

4.4 PRELIMINARY DESIGN CONCEPTS REVIEW AND INPUT

The Team presented the initial review and findings to TAC and CAC on May 31, 2018, and July 19, 2018, respectively. The following subsections summarize the input provided by TAC and CAC members.

4.4.1 TECHNICAL ADVISORY COMMITTEE INPUT

Appendix B includes written comments from TAC members after the Team presented its initial findings on May 31, 2018. The following summarize input that resulted in modifications or additions to alternative design concepts and/or were primary concerns for TAC.

Community representatives on the TAC recommended the Team consider Equivalent Lateral Spacing Operations (ELSO) to move northbound departures assigned to the PADRZ SID further south of La Jolla during daytime hours. ELSO permits aircraft on two separate RNAV departure headings from the same runway to diverge from each other at 10 degrees if the following aircraft is 1.0 nautical miles (NM) from the leading aircraft when cleared for takeoff. This is closer to the standard divergent heading of 15 degrees. The reduction in the divergent angle is in accordance with FAA Order 7110.65X, *Air Traffic Control*, paragraph 5-8-1(a). This concept would maintain safe separation and would move traffic further south of La Jolla. Community representatives included a concept design in the comments received after the TAC meeting. The Team considered the concept in preparation for the CAC meeting.

TABLE 4-1 (1 OF 6) DESIGN PARAMETERS REVIEW FINDINGS AND RECOMMENDATIONS TO ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS

ANAC RECOMMENDATION [1]	ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS[1]	TEAM DESIGN PARAMETER REVIEW FINDINGS	TEAM RECOMMENDATION
Recommendation 14	Move the WNFLD and LANDN waypoints due south so as to align with the relocated Noise Dot #1 at 290° (15° separation from JETTI at 275°) and designate as "Flyover" waypoints in their respective SID's, consistent with JETTI.	Noise Dot #1 is located 1.5 nautical miles (NM) from the shoreline along a 299-degree magnetic heading (based on 11-degrees east magnetic variation) from the departure end of Runway 27. This suggestion recommends moving Noise Dot #1 along a 290-degree magnetic heading at 1.5 NM for the shoreline and designing a procedure that provides a "fly over" waypoint at the location. In addition, ANAC suggested relocating the WNFLD and LANDN waypoints south of their current location to be on the 290-degree magnetic extended course from the departure end of Runway 27. Compared to existing initial departure heading traffic, the Team determined a change in the overflight traffic location for areas exposed to noise levels at or above Community Noise Exposure Level (CNEL) 65 A-weighted decibels (dBA) was possible.	Recommend suggestion be evaluated under the Title 14 Code of Federal Regulations (CFR) Part 150 process due to its potential to change overflight traffic patterns for areas exposed to CNEL 65 dBA or higher.
	Establish within the PADRZ SID procedure a horizontal distance from end of runway (1.0 miles) along a fixed heading which must be satisfied along with altitude before a right turn can be initiated to preclude flights that quickly attain the current 520' altitude and turn right of and prior to Noise Dot #1 before correcting to WYNFLD which results in aircraft flying farther north over Mission Beach.	This suggestion proposes to keep Runway 27 departures on the runway heading until aircraft reach a fixed point on the ground and at a required altitude before turning right. Compared to existing initial departure heading traffic, the Team determined a change in the overflight traffic location for areas exposed to noise levels at or above CNEL 65 dBA was possible.	Recommend suggestion be evaluated under the 14 CFR Part 150 process due to its potential to change overflight traffic patterns for areas exposed to CNEL 65 dBA or higher.
	PADRZ ONE SID - As currently designed the PADRZ ONE departure leaves aircraft very close to and almost paralleling the coast along La Jolla, increasing noise impacts significantly. We recommend moving the WNFLD and KERNL waypoints 1.5 NM south of their current positions. This will ensure aircraft proceed more directly off the coast without paralleling the shore and adds less than a mile of track distance to PADRZ.	Moving WNFLD and KERNL waypoints 1.5 NM south of their current locations would reduce the degree of divergence from aircraft heading 275-degrees from Runway 27. The Federal Aviation Administration (FAA) requires at least a 15-degree angle of divergence between two aircraft departing from the same runway when the leading aircraft is 1.0 NM ahead of the following aircraft at the time the following aircraft is cleared for takeoff. If the 15-degree divergence is not possible, then the following aircraft cannot take off until the leading aircraft is 3.0 NM ahead of the following aircraft. Implementing the suggestion would reduce the departure throughput of Runway 27. Assuming existing initial heading PADRZ Area Navigation (RNAV) Standard Instrument Departure (SID) design, the earliest opportunity to turn west during daytime hours (6:30 a.m. to 9:59 p.m.) is north and east of the WNFLD waypoint to ensure separation between ZZOOO RNAV SID and BORDER 7 SID.	Recommend flight procedure design concepts for departures between 10:00 p.m. and 6:30 a.m., when all departures are assigned the same heading. A concept would turn departures to the west as soon as possible, or at 1.5 NM from the shoreline to stay as far south as possible from La Jolla. The design must maintain the existing PADRZ RNAV SID initial departure design to avoid a change in overflight traffic patterns for areas exposed to CNEL 65 dBA or higher noise levels.

TABLE 4-1 (2 OF 6) DESIGN PARAMETERS REVIEW FINDINGS AND RECOMMENDATIONS TO ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS

ANAC RECOMMENDATION [1]	ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS[1]	TEAM DESIGN PARAMETER REVIEW FINDINGS	TEAM RECOMMENDATION
Recommendation 14 (continued)	Create a new procedure: BROCK-1 (alternative 1) Request FAA to revise PADRZ SID and establish new waypoint BROCK1. Adds min increased flight time and takes aircraft further offshore before turning to northern destinations. This will help all coastal neighborhoods with noise issues.	The BROCK-1 suggestion is not feasible during daytime hours for the same reasons described for the "move WNFLD and KERNL waypoints 1.5 NM south" suggestion.	Recommend a flight procedure design concept for departures between 10:00 p.m. and 6:30 a.m. that is similar to the BROCK suggestion. The design must maintain the existing PADRZ RNAV SID initial departure design to avoid a change in overflight traffic patterns for areas exposed to CNEL 65 dBA or higher noise levels.
	Create a new procedure: BROCK-2 (alternative 2 - preferred) Relocate Waypoints WNFLD and LANDN 0.75 miles directly south or adopt BROCK recommendation. Maintain 274 Departure until Altitude 520 ft. or greater. Maintain 274 departure heading until 520 ft. altitude or greater and the aircraft have reached (new) flyover waypoint 0.25 to 0.5 NM from the end of the runway before turning towards WNFLD, LANDN or new BROCK Waypoint.	The BROCK-2 suggestion is not feasible during daytime hours for the same reasons described for the "move WNFLD and KERNL waypoints 1.5 NM south" suggestion. In addition, the suggested initial heading to a fixed point and altitude is expected to change the existing overflight traffic patterns over areas exposed to CNEL 65 dB or higher noise levels.	Design concept procedure for departures between 10:00 p.m. and 6:30 a.m. that is similar to the BROCK suggestion. The design must maintain the existing PADRZ RNAV SID initial departure design to avoid a change in overflight traffic patterns for areas exposed to CNEL 65 dBA or higher noise levels. Recommend the initial departure heading suggestion be evaluated under the 14 CFR Part 150 process due to its potential to change the overflight traffic patterns for areas exposed to CNEL 65 dBA or higher.
	Do not move the PADRZ SID further south to avoid negative noise impacts on the south side communities of the Point Loma Peninsula	Any proposed procedure design concepts for departures heading north on the PADRZ RNAV SID are not expected to move as far south towards communities of the Point Loma Peninsula.	All proposed design concepts will consider potential noise impacts to the Point Loma Peninsula residents. Any changes to initial departure headings that suggest moving departures further south of 290 degrees would be evaluated under the 14 CFR Part 150 process.
Recommendation 15	East bound flights should reach a minimum of 8K feet before crossing over ZZOOO to minimize thrusters and reduce duration of noise impacts over Point Loma.	A requirement of 8,000 feet MSL at the ZZOOO waypoint is not feasible based on the existing design of the ZZOOO RNAV SID.	Design a concept procedure similar to the ZZOOO RNAV SID but increase the flight path distance between the JETTI and ZZOOO waypoints as a means to increase frequency of aircraft crossing near the ZZOOO waypoint at or above 8,000 feet MSL.
	FAA\TRACON to discourage the practice of redirecting flights off of their filed ZZOOO flight plan departure, to turn north then east over La Jolla. FAA to increase minimum SID flyover\flyby altitudes to encourage increased climb rates.	Some eastbound departures directed by FAA Air Traffic Control (ATC) to turn right over La Jolla occur during nighttime hours. Based on discussions with FAA SCT TRACON staff, an RNAV SID with an initial departure heading to the right and a route to the ZZOOO waypoint would reduce the number of eastbound departures turned right over La Jolla. Because this flight pattern does not occur frequently, designing an RNAV SID for eastbound departures turning right over La Jolla is not feasible.	Design concept procedure for departures between 10:00 p.m. and 6:30 a.m. that turn eastbound departures to the right on the same heading as the existing PADRZ RNAV SID with a flight path turning left heading towards the ZZOOO waypoint. The point where aircraft turn left to the south should be the same as the point where northbound departures turn in a westerly direction. The design should also seek to keep eastbound departures further west of the Point Loma area and provide the ability for most departures to be at or above 8,000 feet MSL near the ZZOOO waypoint.

TABLE 4-1 (3 OF 6) DESIGN PARAMETERS REVIEW FINDINGS AND RECOMMENDATIONS TO ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS

ANAC RECOMMENDATION [1]	ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS[1]	TEAM DESIGN PARAMETER REVIEW FINDINGS	TEAM RECOMMENDATION
Recommendation 15 (continued)	FAA\TRACON to direct that ALL SAN departure separation be limited to between JETTI (275°) and the historical Red Noise Dot #1 (290° vectors from the end of runway 27) for LNSAY, BORDER, PEBLE and ZZOOO, etc. (plus all new Metroplex SID's); Prohibit 250° to 275° departure vector range, except for specific safety events ("Runway 27 STAR Missed Approach Wave Off").	All jet aircraft follow a 275-degree heading and 293-degree magnetic heading (based on 11-degree east magnetic variation) when assigned the ZZOOO and PADRZ RNAV SIDs, respectively. Propeller aircraft can be issued headings outside of the 275- and 293-degree heading range by FAA ATC. Directing all departures to be limited to headings between 275 and 293 degrees will change the overflight traffic location for areas exposed to noise levels at or above CNEL 65 dB and will have a detrimental effect on departure throughput.	Recommend suggestion be evaluated under the 14 CFR Part 150 process due to its potential to change the overflight traffic patterns for areas exposed to CNEL 65 dBA or higher.
	Follow ZZOOO procedure, comply with the JETTI flyover waypoint and consider the establishment of a minimum vectoring altitude for Eastbound turns	The current ZZOOO RNAV SID complies with the 275-degree heading until flying over the JETTI waypoint. Minimum vectoring altitudes (MVA) are not applicable. MVA is driven only by obstacle clearance, and it is a reference for FAA ATC when vectoring aircraft not on a defined procedure. Modifying the MVA is not a feasible method to raise altitudes.	Design a concept procedure similar to the ZZOOO RNAV SID but increase the flight path distance between the JETTI and ZZOOO waypoints as a means to increase the frequency of aircraft crossing near the ZZOOO waypoint at or above 8,000 feet MSL.
	The ZZOOO ONE departure as currently designed puts departing aircraft close to the Point Loma peninsula and the southern end of coastal La Jolla, subjecting residents to increased and at times incessant noise from departing aircraft. Aircraft need to be further offshore before beginning the turn south to the ZZOOO waypoint. We recommend replacing the JETTI waypoint with a waypoint along the same track from the departure end of runway 27 that is 2 NM further west, located at approximately 32.75360N -117.25755W.	Increasing distance from Point Loma shoreline as aircraft turn back to the east towards the ZZOOO waypoint would require a modification to the existing ZZOOO RNAV SID design. Moving the JETTI waypoint further west would move aircraft further west of the Point Loma shoreline, and with increased flight distance, it would increase the frequency of aircraft at or above 8,000 feet MSL near the ZZOOO waypoint.	Design a concept procedure similar to the ZZOOO RNAV SID but move the JETTI waypoint 2.0 NM further west of the current location along the 275-degree magnetic heading from the departure end of Runway 27. The design between the JETTI and ZZOOO waypoints could maintain the same design used for the existing ZZOOO RNAV SID. This design is expected to move traffic further west of Point Loma's shoreline and increase the frequency of aircraft crossing near the ZZOOO waypoint at or above 8,000 feet MSL.
Recommendation 16	Revise COMIX STAR procedure in order to shift flights that Metroplex has moved and concentrated farther South (the downwind leg) over less populated areas and restore prior altitude.	This suggestion is related to SDIA arrivals from the north flying over the La Jolla and East County areas. The following review findings are in two parts: La Jolla Area and East County Area. La Jolla Area - Prior to the COMIX STAR, the BAYVU RNAV STAR was in use as early as 2010. The COMIX RNAV STAR was published in March 2017. The COMIX RNAV STAR indicates a lower altitude prior to crossing the shoreline compared to the BAYVU RNAV STAR: from at or above 9,000 feet MSL to at or above 8,000 feet MSL. In a study conducted by BridgeNet International, the COMIX STAR	La Jolla Area – Design a concept procedure to direct aircraft from the LNTRN waypoint to a waypoint over the I-805 and State Route (SR) 52 interchange thence to the KLOMN waypoint. Altitude at LNTRN should be as high as possible and the descent gradient between LNTRN and KLOMN must meet the FAA's maximum descent gradient requirements. If a concept design passes to the Final Design Concept phase, noise screening analysis must be conducted to determine potential reportable changes in CNEL levels.

TABLE 4-1 (4 OF 6) DESIGN PARAMETERS REVIEW FINDINGS AND RECOMMENDATIONS TO ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS

ANAC RECOMMENDATION [1]	ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS[1]	TEAM DESIGN PARAMETER REVIEW FINDINGS	TEAM RECOMMENDATION
Recommendation 16 (continued)		(**continued**) flight track shifted arrivals 1,200 feet south from the BAYVU RNAV STAR location over the La Jolla area, and the altitude as aircraft crossed the shoreline increased. Based on flight track analysis, BridgeNet International determined the "…changes were not in themselves sufficient to result in measurable changes in noise. The propagation of noise for aircraft above 8,000 feet for a ground shift of 1,200 feet would result in a change of less than 1 dBA. The pre- and post-Metroplex noise measurements did not show a measurable change in the maximum noise levels of aircraft flying the new arrival procedure."[2] Shifting a procedure flight path over populated areas not frequently exposed to COMIX RNAV STAR arrival overflight noise to abate noise may not be considered feasible by the FAA, but it may be confirmed based on noise screening analysis. East County Area - East County residents also indicated changes in aircraft overflights. In November 2016, the FAA implemented a change to the BAYVU RNAV STAR, which added a flight path between the KLOMN waypoint and a new waypoint called NADDO. This path was added to ensure aircraft stay within the Class B airspace. Prior to the change, pilots would be cleared to descend after the KLOMN waypoint to join the final approach to Runway 27. Although the FAA ATC can still monitor the aircraft on radar, pilots would inadvertently descend below the Class B floor. The additional flight path provides a predictable path for pilots to keep the aircraft within the Class B airspace. Changes noticed by East County residents are most likely related to this change, which was carried over to the COMIX RNAV STAR. Proposing a procedure change to keep aircraft on an easterly heading prior to turning south (similar to the procedure prior to the BAYVU RNAV Standard Terminal Arrival Route [STAR] change) to join the final approach would not be feasible by the FAA, unless the Class B airspace floor is lowered. This is based on information the FAA provided in FAA Form 8260-1, Flight Procedure Standards Waiver, related to the COMIX RNAV STAR ending at the NADDO waypoint.[3] The FAA has been working on modifying the Class B, which would include lowering the floor where the flight path between the KLOMN and NADDO waypoints is located, but the FAA could not provide a specific timeline when the change would be implemented.	East County Area – The Authority recommended the formation of an East County working group to assess existing SDIA arrival noise concerns and to identify potential feasible measures to address the concerns. This effort will be independent of this Flight Procedure Evaluation.

TABLE 4-1 (5 OF 6) DESIGN PARAMETERS REVIEW FINDINGS AND RECOMMENDATIONS TO ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS

ANAC RECOMMENDATION [1]	ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS[1]	TEAM DESIGN PARAMETER REVIEW FINDINGS	TEAM RECOMMENDATION
Recommendation 16 (continued)	Shift the waypoint XMANS on the COMIX STAR north to a location that is over the interstate freeway 805 and 52 with the constraint to remain clear of MCAS Miramar's airspace. It would come ashore over Torrey Pines State Park before connecting with KLOMN	Moving traffic closer to the Marine Corp Air Station (MCAS) Miramar may conflict with air traffic operations at MCAS Miramar. Shortening the distance from the shoreline to the KLOMN waypoint, while descending from a higher altitude, may present flight performance issues for users. To maintain the FAA's intent to provide an optimized descent profile for COMIX RNAV STAR, the location of the COMIX and FLSHH waypoints should be maintained. Shifting a procedure flight path over populated areas not frequently exposed to COMIX RNAV STAR arrival overflight noise to abate noise may not be considered feasible by the FAA, but it may be confirmed based on noise screening analysis.	Design a concept procedure to direct aircraft from the LNTRN waypoint to a waypoint over the I-805 and SR 52 interchange thence to the KLOMN waypoint. Initial discussions with SCT TRACON indicated concerns with the MCAS traffic, but it does not expect it to be a significant issue to resolve. Altitude at LNTRN should be as high as possible, and the descent gradient between LNTRN and KLOMN must meet the FAA's maximum descent gradient requirements. If a concept design passes to the Final Design Concept phase, then noise screening analysis must be conducted to determine potential reportable changes in CNEL levels.
	Increase Min. Altitude at LNTRN (LCOVE) at or above 10,000. This change would result in aircraft flying over less populated areas, including industrial businesses, thus reducing the noise impact and saving time/fuel. This proposed path is closer to the historical flight tracks pre-NextGen	This suggestion is related to the "shift the waypoint XMANS" suggestion. Shortening the distance from the shoreline to the KLOMN waypoint, while descending from a higher altitude, may present flight performance issues for users.	Design a concept procedure to direct aircraft from the LNTRN waypoint to a waypoint over the I-805 and SR 52 interchange thence to the KLOMN waypoint. The altitude at LNTRN should be as high as possible, and the descent gradient between LNTRN and KLOMN must meet the FAA's maximum descent gradient requirements. If a concept design passes to the Final Design Concept phase, then noise screening analysis must be conducted to determine potential reportable changes in CNEL levels.
	COMIX ONE STAR: The RNAV-only COMIX ONE arrival is very similar to the existing non-RNAV BAYVU arrival in terms of ground track with a key difference being that the COMIX arrival has an "at or above 8,000 feet" altitude restriction on its last offshore waypoint (LANTRN). The BAYVU arrival has an "at or above 9,000 feet" restriction at its nearly identically-located LCOVE waypoint. This has resulted in aircraft being lower and noisier over La Jolla. We recommend changing the LANTRN waypoint's altitude restriction to "at or above 9,000 feet".	The FAA amended the COMIX RNAV STAR on May 24, 2018, which raised the altitude from at or above 8,000 feet to at or above 9,000 feet at the LNTRN waypoint.[4]	The FAA implemented the ANAC suggestion; therefore, no further evaluation is required.

TABLE 4-1 (6 OF 6) DESIGN PARAMETERS REVIEW FINDINGS AND RECOMMENDATIONS TO ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS

ANAC RECOMMENDATION [1]	ANAC SUBCOMMITTEE PROCEDURE SUGGESTIONS[1]	TEAM DESIGN PARAMETER REVIEW FINDINGS	TEAM RECOMMENDATION
Recommendation 16 (continued)	Direct traffic from COMIX waypoint direct to the KLOMN waypoint (suggested at July 19, 2018 CAC meeting)	A flight path from the COMIX waypoint to the KLOMN waypoint would move the majority of arrivals from the north over communities that do not experience frequent arrival overflights. Therefore, the potential to cause a noise impact is high. Noise screening analysis is not required due to the substantial change in distance from the existing procedure location to the proposed location.	Recommended to eliminate from further evaluation.

NOTES:
Fly Over Waypoint – a waypoint in an RNAV procedure over which an aircraft is expected to fly before the turn to the next segment of the route is initiated.
Fly By Waypoint – a waypoint in an RNAV procedure where a turn is initiated prior to reaching it.
Minimum Vector Altitude (MVA) – the lowest altitude, expressed in feet above mean sea level, to which an air traffic controller may issue aircraft altitude clearances during vectoring/direct routing, except if otherwise authorized for approaches, departures, and missed approaches. The minimum vectoring altitude in each sector provides 1,000 feet above the highest obstruction in non-mountainous areas and 2,000 feet above the highest obstacle in designated mountainous areas. MVA is the lowest altitude that meets obstacle clearance requirements in the airspace specified. Minimum vectoring altitudes should be sufficiently high to minimize activation of aircraft ground proximity warning systems.

1 San Diego County Regional Airport Authority, *Board Agenda and Meeting Materials – December 7, 2017*, "Item 15 - Action Plan for Addressing the Airport Noise Advisory Committee (ANAC) Recommendations," Exhibit A: Airport Noise Advisory Committee (ANAC) Sub-committee Recommendation (ANAC Approval), Approved, https://san.org/Airport-Authority/Meetings-Agendas?EntryId=9048 (accessed September 13, 2018).
2 BridgeNet International, *La Jolla Aircraft Noise and Flight Track Analysis*, October 11, 2017, page 5.
3 U.S. Department of Transportation, Federal Aviation Administration, Flight Procedures Standard Waiver – FAA Form 8260-1 for COMIX RNAV STAR, https://www.faa.gov/air_traffic/flight_info/aeronav/procedures/application/?event=procedure.results&tab=ndbr&nasrId=SAN#searchResultsTop (accessed February 7, 2018).
4 U.S. Department of Transportation, Federal Aviation Administration, COMIX TWO STAR (RNAV)-AL 373 Chart, https://www.faa.gov/aero_docs/dtpp/1810/00373COMIX.PDF#nameddest=(SAN) (accessed October 3, 2018).

SOURCE: Ricondo & Associates, Inc., September 2018.

TABLE 4-2 PRELIMINARY DRAFT DESIGN CONCEPT PHASE SUMMARY

ALTERNATIVE DESIGN CONCEPTS	PASS TO DRAFT	PASS TO 14 CFR PART 150 PROCESS	ELIMINATE
Recommendation 14 – Revise PADRZ SID or create a new procedure to reduce increased noise in La Jolla, Mission Beach, and Pacific Beach.			
Alternative 1 – Fly Over Turn at 1.5 NM from Shoreline (Nighttime)	√		
Alternative 1 – Fly By Turn at 1.5 NM from Shoreline (Nighttime)	√		
Alternative 2 – Fly By Turn at Shoreline (Nighttime)			**X (65,DC,SF)**
Alternative 3 – Fly By Turn at CNEL 65 Contour (Nighttime)			**X (65,DC,SF)**
Recommendation 15 – Revise ZZOOO to significantly reduce or eliminate flights over the Point Loma Peninsula, including Cabrillo National Park, and reduce or eliminate eastbound turns over La Jolla.			
Alternative 1 – Extend JETTI Waypoint 2.0 NM West (Daytime)	√		
Alternative 2 – Fly By Turn at 1.5 NM from Shoreline then to ZZOOO Waypoint (Nighttime)	√		
Alternative 3 – Fly Over Turn at 1.5 NM from Shoreline then to ZZOOO Waypoint (Nighttime)	√		
Recommendation 16 – Reassess and revise the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the north in a very narrow corridor.			
Alternative 1 – Cross LNTRN Waypoint at 9,000 Feet to I-805/SR 52 at 7,000 Feet to KLOMN Waypoint at 6,000 Feet			**X (AI)**
Alternative 2 – Cross LNTRN Waypoint at 9,000 Feet Direct to KLOMN Waypoint at 6,000 Feet			**X (AI)**
Alternative 3 – Cross BAUCA Waypoint at 9,000 Feet Direct to KLOMN Waypoint at 6,000 Feet			**X (AI)**

NOTES:
NM – Nautical Miles
CNEL – Community Noise Exposure Level
Daytime – 6:30 a.m. to 9:59 p.m.
Nighttime – 10:00 p.m. to 6:30 a.m. There is a departure curfew between 11:30 p.m. and 6:30 a.m. If a departure happens to occur during curfew hours, the proposed procedure would be preferred during the curfew hours.
Waypoint – a predetermined geographical position that is defined in terms of latitude/longitude coordinates. A waypoint is most often used to indicate a change in direction, speed, or altitude along the desired path. RNAV procedures make use of both fly-over and fly-by waypoints.
Fly Over Waypoint – used to define a turn when the aircraft must fly over the point prior to starting a turn.
Fly By Waypoint – used to define a turn when an aircraft should begin a turn to the next course prior to reaching the waypoint. The aircraft would not fly over the waypoint.
65 – CNEL 65 dBA Influence – the concept presents the potential to change the CNEL 65 dBA and higher noise exposure area and should be analyzed in the 14 CFR Part 150 process.
AI – ANAC Intent – the concept does not adequately meet the intent of, or conflicts with, ANAC recommendations.
DC – Design Criteria – the concept does not provide preferred predictable flight patterns due to design, or it is contrary to FAA design preferences.
SF – Safety – the concept presents a strong potential for reducing safety and/or increasing the level of risk for existing hazards that are effectively mitigated.
SOURCE: Ricondo & Associates, Inc., December 2018.

Community representatives also proposed turning nighttime northbound departures to the west closer to the shoreline instead of maintaining a northwest-bound heading until 1.5 NM from the shoreline. The Team did evaluate two design concepts (turn to the west at the shoreline and turn to the west prior to the Mission Bay inlet). Both designs were not feasible based on the FAA TARGETS design analysis. In addition, both would cause potential changes for areas exposed to CNEL 65 dBA or higher. The Team recommended additional discussion with CAC to gather input on an alternative design concept that would turn aircraft west somewhere between the shoreline and 1.5 NM from the shoreline.

Airline representatives indicated concerns related to the alternative design concepts for Recommendation 16 (arrivals from the north to Runway 27). They indicated the descent from the LNTRN waypoint at 8,000 feet mean sea level (MSL) to the KLOMN waypoint at 6,000 feet MSL is already difficult to make for the navigation software onboard the aircraft, especially for aircraft with modern wing design (e.g., Embraer 175 and Boeing 737-MAX models). Steep descents in addition to speed reductions are not recommended for arrival procedures. This combination could lead some navigation software to reduce speed well before the air traffic controller would like the aircraft to be at a slower speed, leading to potential noncompliance with ATC instructions. The Team recommended further consideration of airline concerns during design refinements in the Draft Design Concept phase and would seek further input.

4.4.2 CITIZEN ADVISORY COMMITTEE INPUT

Appendix B includes written comments from CAC members after the Team presented its initial findings on July 19, 2018. The following summarize the input that resulted in modifications or additions to alternative design concepts and/or were primary concerns for CAC.

Based on input received related to the Team's recommendation to eliminate suggested changes to the PADRZ SID for daytime departures, CAC suggested one design concept based on ELSO. The CAC concept alternative proposed a 285-degree magnetic heading from Runway 27 to a waypoint further south of La Jolla compared to the existing PADRZ SID WNFLD waypoint location. The Team added one alternative design concept during daytime operations for consideration during the Draft Design Concept phase: Recommendation 14, Alternative 6 – ELSO (285-degree heading) (Daytime).

CAC also requested the application of the 10-degree divergent heading for nighttime departures, as well as an alternative design to turn departures west closer to the shoreline. The Team added four alternative design concepts for consideration during the Draft Design Concept phase: Recommendation 14, Alternative 4 – Fly By Turn between Shoreline and 1.5 NM (Nighttime); Recommendation 14, Alternative 5 – ELSO (285-degree heading) to Fly By Turn at 1.5 NM from Shoreline (Nighttime); Recommendation 15, Alternative 4 – Fly By Turn between Shoreline and 1.5 NM from Shoreline then to ZZOOO (Nighttime); and Recommendation 15, Alternative 5 – ELSO (285-degree heading) to Fly By Turn at 1.5 NM from Shoreline then to ZZOOO (Nighttime).

Based on CAC input, the Team identified two additional alternative design concepts for Recommendation 16 for consideration in the Draft Design Concept phase. CAC indicated the three preliminary alternative design concepts did not adequately meet the intent of Recommendation 16. The closest of the three was Alternative 1, which proposed to cross arrivals from the north over the LNTRN waypoint at 9,000 feet MSL, thence to the Interstate 805 (I-805) / State Road (SR) 52 intersection at 7,000 feet MSL, thence to the KLOMN waypoint at 6,000 feet MSL. CAC requested the crossing altitude over the LNTRN waypoint to be increased to 10,000 feet MSL. The Team added two alternative design concepts for consideration during the Draft Design Concept phase: Recommendation 16, Alternative 1, Version 2 – Cross LNTRN Waypoint at 10,000 Feet to I-805/SR 52 at 8,000 Feet to the KLOMN Waypoint

at 6,000 Feet; and Recommendation 16, Alternative 2, Version 2 – Cross LNTRN Waypoint at 10,000 Feet Direct to KLOMN Waypoint at 6,000 Feet.

CAC requested an alternative design concept for northbound departures with an initial heading of 290-degrees magnetic. The intent was to comply with the historic noise abatement heading for nighttime departures. Similar to ANAC Recommendation 17, the Team recommended this and other proposed alternative concepts (e.g., 290-degree heading from the end of Runway 27, 290-degree heading after a set distance from the end of Runway 27, and equal distribution between 275-degree heading and 290-degree heading departures at night) related to the nighttime noise abatement departure heading to be evaluated as part of the 14 CFR Part 150 process. Proposals to change the initial right-turn heading should be evaluated to cumulatively assess potential changes to the CNEL 65 dBA and higher exposure area, which is not included in this air traffic procedure evaluation. The 14 CFR Part 150 process is designed to assess the full potential effects on areas exposed to CNEL 65 dBA or higher.

5. DRAFT DESIGN CONCEPTS

The Draft Design Concept phase involved two steps:

1. Develop and design conceptual procedures using the FAA's TARGETS software based on TAC and CAC input from the Preliminary Draft Design phase.
2. Review and gather input from TAC and CAC on initial findings to determine if adjustments are required or the recommendation should no longer be considered based on design parameters and/or ANAC intent.

The Team evaluated fifteen (15) procedure design concepts based on the Preliminary Draft Design Concept phase evaluation results and TAC/CAC input; five were carried over from the Preliminary Draft Design Concept phase and ten were designed to address CAC and TAC input on the Team's Preliminary Draft Design Concept phase initial findings. The procedure design concepts were as follows:

- Five design concepts carried over from the Preliminary Draft Design Concept phase:
  - Recommendation 14 – Alternative 1 – Fly Over Turn at 1.5 NM from Shoreline (Nighttime – 10:00 p.m. to 6:30 a.m.[19])
  - Recommendation 14 – Alternative 1 – Fly By Turn at 1.5 NM from Shoreline (Nighttime – 10:00 p.m. to 6:30 a.m.)
  - Recommendation 15 – Alternative 1 – Extend JETTI waypoint 2.0 NM West (Daytime – 6:30 a.m. to 9:59 p.m.)
  - Recommendation 15 – Alternative 2 – Fly By Turn at 1.5 NM from Shoreline then to ZZOOO (Nighttime – 10:00 p.m. to 6:30 a.m.)
  - Recommendation 15 – Alternative 3 – Fly Over Turn at 1.5 NM from Shoreline then to ZZOOO (Nighttime – 10:00 p.m. to 6:30 a.m.)
- Two revised versions of previous departure procedure concepts evaluated in the Preliminary Draft Design Concept phase:
  - Recommendation 14 – Alternative 1 Version 2 – Fly By Turn at 1.5 NM from Shoreline (Nighttime – 10:00 p.m. to 6:30 a.m.)
  - Recommendation 15 – Alternative 2 Version 2 – Fly By Turn at 1.5 NM from Shoreline then to ZZOOO (Nighttime – 10:00 p.m. to 6:30 a.m.)
- Five new departure procedure design concepts requested by CAC to incorporate ELSO and turns closer to the shoreline:
  - Recommendation 14 – Alternative 4 – Fly By Turn between Shoreline and 1.5 NM (Nighttime – 10:00 p.m. to 6:30 a.m.)
  - Recommendation 14 – Alternative 5 – ELSO (285-degree heading) to Fly By Turn at 1.5 NM from Shoreline (Nighttime – 10:00 p.m. to 6:30 a.m.)

[19] There is a departure curfew between 11:30 p.m. and 6:30 a.m. If a departure happens to occur during curfew hours, the proposed procedures designated with hours between 10:00 p.m. and 6;30 a.m. would be preferred during the curfew hours.

  - Recommendation 14 – Alternative 6 – ELSO (285-degree heading) (Daytime – 6:30 a.m. to 9:59 p.m.)
  - Recommendation 15 – Alternative 4 – Fly By Turn between Shoreline and 1.5 NM from Shoreline then to ZZOOO (Nighttime – 10:00 p.m. to 6:30 a.m.)
  - Recommendation 15 – Alternative 5 – ELSO (285-degree heading) to Fly By Turn at 1.5 NM from Shoreline then to ZZOOO (Nighttime – 10:00 p.m. to 6:30 a.m.)
- Two revised versions for Recommendation 16 from the Preliminary Draft Design Concept phase based on CAC input:
  - Alternative 1 Version 2 – Cross LNTRN at 10,000 Feet to I-805/SR 52 at 8,000 Feet to KLOMN at 6,000 Feet
  - Alternative 2 Version 2 – Cross LNTRN at 10,000 Feet Direct to KLOMN at 6,000 Feet
- One revised version for Recommendation 16 based on TAC input during the Draft Design Concept phase:
  - Alternative 1 Version 3 – Cross LNTRN at or above 8,000 Feet to I-805/SR 52 at 7,000 Feet to KLOMN at 6,000 Feet

5.1 DRAFT DESIGN CONCEPT RESULTS SUMMARY

Table 5-1 lists the alternative design concepts and the findings based on criteria described in Section 3.2.2 and input from CAC and TAC. Table 5-1 includes criteria categories to identify the reason(s) why a recommendation or suggestion should not be carried forward to the next phase. Refer to the procedure design sheets in Appendix D for more detail on the draft procedure designs and evaluation results.

Of the 15 alternative design concepts evaluated, six were passed to the Final Design Concept phase, three were recommended to be considered in the 14 CFR Part 150 process, and six were eliminated from further consideration. Additionally, two alternative design concepts were eliminated due to a strong potential for reducing safety and not being preferred compared to similar concepts; two concepts were eliminated because similar concepts better met ANAC Recommendation 14. One concept for Recommendation 16 was eliminated because it did not adequately meet the intent of the recommendation. A second concept for Recommendation 16 was eliminated due to safety and operation feasibility concerns related to aircraft descent performance capabilities. Additional information related to the findings are provided on the individual procedure design concept sheets in Appendix D.

Based on input from East County CAC representation, the Authority recognized the need to form a working group comprised of East County community representatives to discuss multiple noise concerns related to arrivals from the northwest that turn south over East County to join the final approach. The intent of the working group was to identify aircraft noise concerns and provide input to the Authority and the Team related to traffic procedure design concepts that may address the concerns. This process took place separately from the ANAC Recommendations flight procedure analysis described in this document. The first meeting with the East County Working Group (ECWG) was December 6, 2018. The Authority expects a separate report will be developed summarizing the process and results of the ECWG effort and will be added as **Appendix E** to this report when completed.

5.2 DRAFT DESIGN CONCEPT RESULTS REVIEW AND INPUT

The Team presented the alternative design concepts and initial findings to TAC and CAC on August 30, 2018. The following subsections summarize the input provided by TAC and CAC members

TABLE 5-1 DRAFT DESIGN CONCEPT PHASE SUMMARY

ALTERNATIVE DESIGN CONCEPTS	PASS TO FINAL	PASS TO 14 CFR PART 150 PROCESS	ELIMINATE
Recommendation 14 – Revise PADRZ SID or create a new procedure to reduce increased noise in La Jolla, Mission Beach, and Pacific Beach.			
Alternative 1 – Fly Over Turn at 1.5 NM from Shoreline (Nighttime)			**X (AI,SF)**
Alternative 1 – Fly By Turn at 1.5 NM from Shoreline (Nighttime)			**X (AI)**
Alternative 1 Version 2 – Fly By Turn at 1.5 NM from Shoreline (Nighttime)	√		
Alternative 4 – Fly By Turn between Shoreline and 1.5 NM (Nighttime)	√		
Alternative 5 – ELSO (285-degree heading) to Fly By Turn at 1.5 NM from Shoreline (Nighttime)		**√(65)**	
Alternative 6 – ELSO (285-degree heading) (Daytime)		**√(65)**	
Recommendation 15 – Revise ZZOOO to significantly reduce or eliminate flights over the Point Loma Peninsula, including Cabrillo National Park, and reduce or eliminate eastbound turns over La Jolla.			
Alternative 1 – Extend JETTI Waypoint 2.0 NM West (Daytime)	√		
Alternative 2 – Fly By Turn at 1.5 NM from Shoreline then to ZZOOO Waypoint (Nighttime)			**X (AI)**
Alternative 2 Version 2 – Fly By Turn at 1.5 NM from Shoreline then to ZZOOO Waypoint (Nighttime)	√		
Alternative 3 – Fly Over Turn at 1.5 NM from Shoreline then to ZZOOO Waypoint (Nighttime)			**X (AI,SF)**
Alternative 4 – Fly By Turn between Shoreline and 1.5 NM from Shoreline then to ZZOOO Waypoint (Nighttime)	√		
Alternative 5 – ELSO (285-degree heading) to Fly By Turn at 1.5 NM from Shoreline then to ZZOOO Waypoint (Nighttime)		**√(65)**	
Recommendation 16 – Reassess and revise the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the north in a very narrow corridor.			
Alternative 1 Version 2 – Cross LNTRN Waypoint at 10,000 Feet to I-805/SR 52 at 8,000 Feet to KLOMN Waypoint at 6,000 Feet			**X (OF,SF)**
Alternative 1 Version 3 – Cross LNTRN Waypoint at or above 8,000 Feet to I-805/SR 52 at 7,000 Feet to KLOMN Waypoint at 6,000 Feet	√		
Alternative 2 Version 2 – Cross LNTRN Waypoint at 10,000 Feet Direct to KLOMN Waypoint at 6,000 Feet			**X (AI,OF,SF)**

NOTES:
NM – Nautical Miles
ELSO – Equivalent Lateral Spacing Operations
Daytime – 6:30 a.m. to 9:59 p.m.
Nighttime – 10:00 p.m. to 6:30 a.m. There is a departure curfew between 11:30 p.m. and 6:30 a.m. If a departure happens to occur during curfew hours, the proposed procedure would be preferred during the curfew hours.
Waypoint – a predetermined geographical position that is defined in terms of latitude/longitude coordinates. A waypoint is most often used to indicate a change in direction, speed, or altitude along the desired path. RNAV procedures make use of both fly-over and fly-by waypoints.
Fly Over Waypoint – used to define a turn when the aircraft must fly over the point prior to starting a turn.
Fly By Waypoint – used to define a turn when an aircraft should begin a turn to the next course prior to reaching the waypoint. The aircraft would not fly over the waypoint.
65 – CNEL 65 dBA Influence – the concept presents the potential to change the CNEL 65 dBA and higher noise exposure area and should be analyzed in the 14 CFR Part 150 process.
AI – ANAC Intent – the concept does not adequately meet the intent of, or conflicts with, ANAC recommendations.
NI – Noise Impact – the concept would cause reportable noise increases for communities not represented by the Citizen Advisory Committee based on qualitative or quantitative analysis.
OF – Operational Feasibility – the concept presents constraints to the airfield's capacity, the efficient use of the airspace, the FAA's ability to meet its mission and goals, and/or the airline/air traffic controller's ability to comply with the procedure consistently.
SF – Safety – the concept presents a strong potential for reducing safety and/or increasing the level of risk for existing hazards that are effectively mitigated.
SOURCE: Ricondo & Associates, Inc., December 2018.

5.2.1 TECHNICAL ADVISORY COMMITTEE INPUT

Appendix B includes written comments from TAC members after the Team presented its initial findings on August 30, 2018. The following summarizes the input that resulted in modifications or additions to design concepts and/or were primary concerns for TAC

Airline representatives indicated concerns related to Recommendation 16, Alternative 1 Version 2 and Recommendation 16, Alternative 2 Version 2 regarding the descent from the LNTRN waypoint at 10,000 feet MSL to the KLOMN waypoint at 6,000 feet MSL, indicating it would be very difficult for the navigation software onboard the aircraft to achieve the design altitudes, especially for aircraft with modern wing design (e.g., Embraer 175 and Boeing 737-MAX models). In general, steep descents combined with speed reductions are not recommended for arrival procedures. The combination could cause some navigation software to reduce speed well before the air traffic controller would like the aircraft to be at a slower speed, leading to potential conflicts or noncompliance with air traffic control instructions. As a result of the input, the Team determined the proposed concept would not be feasible. A CAC representative recommended lowering the altitude over LNTRN while maintaining the same route design. The Team recommended a modified design with an at or above 8,000-foot MSL altitude restriction over the LNTRN waypoint. Airline representatives indicated similar concerns to a lesser degree, but TAC ultimately agreed with the refined design (Recommendation 16, Alternative 1 Version 3) to assess potential aircraft noise effects.

5.2.2 CITIZEN ADVISORY COMMITTEE INPUT

Appendix B includes written comments from CAC members after the Team presented its initial findings on August 30, 2018. The following summarize the input that resulted in modifications or additions to design concepts and/or were primary concerns for CAC.

In general, CAC members concurred with the Team's recommendations identified in Table 4-3. CAC members representing the Ocean Beach and Mission Beach area indicated concerns related to the ELSO alternatives. CAC members representing the La Jolla area indicated support related to the ELSO alternatives. The Team explained the potential noise exposure changes an ELSO alternative may cause and, due to potential changes, it should be passed to the 14 CFR 150 process. A CAC representative from the Point Loma area requested a departure design for Recommendation 14 that directs departures on the 290-degree magnetic heading. The Team indicated the proposed change could adversely affect areas exposed to CNEL 65 dBA or higher, and it should be evaluated among other proposed departure headings (e.g., ELSO) under the 14 CFR Part 150 process.

6. FINAL DESIGN CONCEPT

The Final Design Concept phase involved five steps:

1. Refine conceptual procedures passed in the Draft Design Concept phase.
2. Review and gather input from TAC and CAC on final designs for noise screening.
3. Conduct noise screening analysis on final design concepts.
4. Review and gather input from TAC and CAC on noise screening results and initial recommendations.
5. Finalize recommendations to the Authority for consideration.

The Team recommended one alternative design concept to pass to next steps under consideration by the Authority: ANAC Recommendation 15 Alternative 1 (Daytime jet departures- Extend JETTI Waypoint 2.0 NM West). At the May 23, 2019 CAC and TAC joint meeting, CAC indicated their preference to maintain the 1.5 NM early turn restriction and not proceed forward with the nighttime jet departure design concepts until a recommended nighttime jet departure noise abatement path is evaluated and recommended under the 14 CFR Part 150 process. Based on CAC input and preference, the Team recommended ANAC Recommendation 14 Alternative 1 (Nighttime[20] jet departures-Fly By Turn at 1.5 NM from Shoreline) and ANAC Recommendation 15 Alternative 2 (Nighttime jet departures-Fly By Turn between at 1.5 NM from Shoreline then to ZZOOO Waypoint), but hold the two nighttime design concepts from further consideration until the 14 CFR Part 150 Study concludes on a recommended nighttime noise abatement flight jet departure path from Runway 27 (associated with ANAC Recommendations 17 and 21).

6.1 FINAL DESIGN CONCEPT RESULTS SUMMARY

Table 6-1 summarizes the Team's recommendations based on noise screening and TAC/CAC input. Table 6-1 includes criteria categories to identify the reason(s) why an alternative design concept should not be carried forward to next steps under consideration by the Authority.

6.2 REFINED DESIGN CONCEPT REVIEW

The Team conducted refinements to the procedure design concepts passed to the Final Design Concept phase. Descriptions of the refined designs, where applicable, are available on the procedure design sheets in Appendix D. The Team presented the alternative design concepts to TAC and CAC on October 25, 2018, to gather input prior to the noise screening analysis. TAC and CAC concurred with the designs for noise screening.

6.3 AIRCRAFT NOISE SCREENING OF FINAL DESIGN CONCEPTS

An aircraft noise screening analysis was conducted to quantify potential decreases and increases in the CNEL as a result of implementing the procedure design concepts identified in the Final Design Concept phase. The methodology was similar to how the FAA conducts noise screening for individual flight procedures. The screening analysis evaluated only jet aircraft associated with the proposed procedures, and it did not evaluate all operations to and from SDIA. Therefore, the screening results do not reflect cumulative aircraft noise levels at SDIA, and they

[20] There is a departure curfew between 11:30 p.m. and 6:30 a.m. If a departure happens to occur during curfew hours, the proposed procedures designated between 10:00 p.m. and 6;30 a.m. would be preferred during the curfew hours.

should not be referenced for general noise planning purposes for SDIA. The following subsections summarize the methodology and results for each alternative procedure design concept.

TABLE 6-1 FINAL DESIGN CONCEPT PHASE SUMMARY

ALTERNATIVE DESIGN CONCEPTS	PASS TO NEXT STEPS	ELIMINATE
Recommendation 14 – Revise PADRZ SID or create a new procedure to reduce increased noise in La Jolla, Mission Beach, and Pacific Beach.		
Alternative 1 Version 2 – Fly By Turn at 1.5 NM from Shoreline (Nighttime)	√	
Alternative 4 – Fly By Turn between Shoreline and 1.5 NM (Nighttime)		X (ET)
Recommendation 15 – Revise ZZOOO to significantly reduce or eliminate flights over the Point Loma Peninsula, including Cabrillo National Park, and reduce or eliminate eastbound turns over La Jolla.		
Alternative 1 – Extend JETTI Waypoint 2.0 NM West (Daytime)	√	
Alternative 2 Version 2 – Fly By Turn at 1.5 NM from Shoreline then to ZZOOO Waypoint (Nighttime)	√	
Alternative 4 – Fly By Turn between Shoreline and 1.5 NM from Shoreline then to ZZOOO Waypoint (Nighttime)		X (ET)
Recommendation 16 – Reassess and revise the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the north in a very narrow corridor.		
Alternative 1 Version 3 – Cross LNTRN Waypoint at or above 8,000 Feet to I-805/SR 52 at 7,000 Feet to KLOMN Waypoint at 6,000 Feet		X (NI)

NOTES:
NM – Nautical Miles
Daytime – 6:30 a.m. to 9:59 p.m.
Nighttime – 10:00 p.m. to 6:30 a.m. There is a departure curfew between 11:30 p.m. and 6:30 a.m. If a departure happens to occur during curfew hours, the proposed procedure would be preferred during the curfew hours.
Waypoint – a predetermined geographical position that is defined in terms of latitude/longitude coordinates. A waypoint is most often used to indicate a change in direction, speed, or altitude along the desired path. RNAV procedures make use of both fly-over and fly-by waypoints.
Fly Over Waypoint – used to define a turn when the aircraft must fly over the point prior to starting a turn.
Fly By Waypoint – used to define a turn when an aircraft should begin a turn to the next course prior to reaching the waypoint. The aircraft would not fly over the waypoint.
ET – Does not maintain 1.5 NM early turn restriction
NI – Noise Impact – the concept would cause reportable noise increases for communities not represented by the Citizen Advisory Committee based on qualitative or quantitative analysis.
SOURCE: Ricondo & Associates, Inc., December 2018.

6.3.1 NOISE SCREENING METHODOLOGY

The objective of the aircraft noise screening analysis was to quantify potential decreases and increases in the CNEL if the location of jet aircraft traffic was changed to a different location and/or altitude in accordance with a proposed procedure design concept. The results of the screening analysis do not reflect existing cumulative average annual day operations and traffic patterns at SDIA; therefore, are not intended to reflect total aircraft CNEL noise exposure levels for SDIA. The following subsections describe the baseline and alternative Aviation Environmental Design Tool (AEDT) noise model development methodologies.

6.3.1.1 BASELINE NOISE MODEL DEVELOPMENT METHODOLOGY

The analysis began with the development of a baseline model using the FAA's AEDT that accounts for current jet operations and location related to only traffic flows connected to the proposed design concepts. Propeller-driven aircraft were excluded based on the following factors:

- The majority of all propeller-driven aircraft are not assigned or do not fly along an existing published RNAV SID; therefore, traffic patterns with and without implementing a proposed procedure design concept would not change.
- The largest turbine-propeller aircraft, the Bombardier Q400, operates at SDIA no more than five arrivals and five departures on an average day—CNEL is below 45 dBA for Bombardier Q400 SDIA operations over areas such as La Jolla and Point Loma. This was not a major contributor to total CNEL compared to jet aircraft.

The jet aircraft operations selected were those operating on an existing flight procedure, which was proposed to change to meet an ANAC recommendation. **Table 6-2** summarizes the existing traffic flow and flight procedures selected for the baseline screening model and the related Final Design Concept phase alternative.

TABLE 6-2 BASELINE MODEL EXISTING TRAFFIC FLOW

TRAFFIC FLOW	EXISTING PROCEDURE	FINAL DESIGN CONCEPT
Runway 27 jet departures to the northwest	PADRZ RNAV SID, CWARD RNAV SID, PEBLE Conventional SID, ECHHO RNAV SID, MMOTO RNAV SID, FALCC Conventional SID, and FAA ATC Radar Vectors to the northwest[1/]	Recommendation 14 Alternative 1 Version 2 Recommendation 14 Alternative 4
Runway 27 jet departures to the east	ZZOOO RNAV SID, BORDER Conventional SID, and FAA ATC Radar Vectors to the east	Recommendation 15 – Alternative 1 Recommendation 15 – Alternative 2 Version 2 Recommendation 15 – Alternative 4
Runway 27 jet arrivals from the northwest	COMIX RNAV STAR, HUBRD Conventional STAR, and FAA ATC Radar Vectors from northwest to KLOMN waypoint area	Recommendation 16 – Alternative 1 Version 3

NOTES:

1/ MMOTO RNAV SID, ECHHO RNAV SID and the FALCC Conventional SID were not modified as part of ANAC Recommendation 14 because these SIDs are used when FAA lands aircraft on Runway 9 and departs aircraft on Runway 27. The proposed final design concepts for ANAC Recommendation 14 conflict with existing arrival procedures for Runway 9. The traffic was included in the baseline model to account for noise energy in focused community areas.

ATC – Air Traffic Control

RNAV – Area Navigation

SID – Standard Instrument Departure procedure

STAR – Standard Terminal Arrival Route

SOURCE: Ricondo & Associates, Inc., January 2019.

The primary source used to develop the baseline noise model flight track and the operations input into AEDT was radar track and operations data between May 2017 and December of 2017. The data were collected from the Authority's Airport and Noise Management System (ANOMS). The entire year of 2017 was not collected because the FAA did not complete the implementation of the SoCal Metroplex RNAV procedures until April 2017. The intent for the baseline model was to include traffic patterns after the FAA completed implementation. The seven months of radar track and flight plan data were more than adequate to conduct a noise screening assessment, and this exceeds the amount of data typically used by the FAA when conducting screening analyses (typically 10 randomly selected days).

The arrival and departure radar tracks and associated flight data were reviewed to ensure the accuracy of runway assignments, and radar tracks with unusable geometry were excluded from the analysis. Radar track data not associated with Runway 27 arrivals from the northwest and Runway 27 departures heading northwest or east were excluded. Each radar track was tagged with its propulsion type (jet, turbine-propeller, piston propeller), aircraft weight category (heavy, large, small), and time of day (daytime, 7:00 a.m. to 6:59 p.m.; evening, 7:00 p.m. to 9:59 p.m.; and nighttime, 10:00 p.m. to 6:59 a.m.).

Following the data cleanup and tagging stage, the geometries of the radar track departures from Runway 27 and arrivals from the northwest to Runway 27 were reviewed to group flights with similar flight paths into the same corridors (e.g., aircraft following the same arrival or departure procedure). The grouping process was sensitive to flight path dispersion (RNAV or conventional dispersion), initial departure headings from Runway 27, and time of day (daytime/evening hours or nighttime hours). The groups of radar tracks are referred to as bundles.

AEDT noise model flight tracks were created for each individual bundle of radar tracks. The noise model flight tracks represent the radar track bundles with a system of primary flight noise model tracks, or "backbone" tracks, and additional "dispersed" noise model tracks. The combination of backbone and dispersed tracks serve as representative AEDT noise model flight tracks for a given bundle. The backbone noise model track lies at the center of a bundle, with one or more dispersed noise model tracks on each side. The location of the backbone and dispersed tracks were based on the track density of a unique bundle. Geographic spatial analysis tools were employed to identify the average or center of a bundle (the backbone) at multiple increments along the bundle. The analysis also identified points left and right of the average according to the radar track distribution within a unique bundle. The left and right points were used to develop the dispersed noise model tracks.

The altitude for each bundle was also evaluated to determine the need to customize the altitude profile to better reflect actual average annual day altitude along a specific traffic flow. In addition, aircraft altitude profiles may need to be extended to ensure the AEDT models aircraft noise over communities within the evaluation area. By default, AEDT aircraft altitude profiles begin at 6,000 feet above field elevation (AFE) for arrivals and end at 10,000 feet AFE for departures. Based on radar data analysis, frequent level segments for jet departures were not observed, but some jet departures to the east could reach 10,000 feet AFE within the evaluation area. Therefore, altitude profile customization was required to extend the eastbound jet climb profile to a higher altitude by using an at or above altitude requirement over the East County area to ensure all departure jet aircraft noise is captured within the evaluation area. Runway 27 jet arrivals from the northwest did occur over 6,000 feet AFE within the evaluation area as traffic crosses over the La Jolla area and, in several instances, do not reach 6,000 feet AFE until north of SDIA. In addition, the proposed design concept for Runway 27 arrivals from the northwest specifies altitude requirements at key points. Therefore, altitude profiles were customized for the arrivals using altitude controls at specific locations, as defined by the existing RNAV arrival procedure (e.g., COMIX RNAV STAR) or the calculated average altitude profile of a bundle (for conventional procedures and FAA ATC radar vectored traffic). The AEDT would calculate the

altitude and aircraft performance profiles based on the user-defined altitude controls and the standard aircraft procedure profile database provided in AEDT.

The flight information (e.g., aircraft type, number of operations, and origin/destination) from each radar track in a bundle were assigned to the corresponding noise model flight tracks representing the bundle. Flight operation distribution among the backbone and dispersed noise model tracks was based on actual distribution observed radar track density of the bundle of radar tracks. This dispersion more accurately represents each flight corridor by accounting for variability attributable to weather, aircraft type, traffic, pilot technique, and other factors. The count of operations was converted to an average annual day level by dividing the count by 244 days (number of days between May 2017 and December 2017). Of the 591 total AAD operations that occurred at SDIA between May 2017 and December 2017, 396 AAD operations associated with the traffic flows identified in Table 6-2 were modeled.[21] The noise model flight tracks and the flight operations database were converted into AEDT format.

The baseline AEDT model included not only the noise model flight tracks and average annual day operations, but also the terrain (provided by U.S. Geological Survey [USGS]), the average weather conditions (temperature, humidity, and air pressure) observed at SDIA in 2017, and the uniformed closely spaced grid points. The CNEL was calculated for each uniformed closely spaced grid. The use of grid points in lieu of noise exposure contours is consistent with the FAA ATO's noise screening methodology. The CNEL was compared to the alternative CNEL at each grid point to determine potential decreases and increases resulting from implementing a proposed design concept alternative.

6.3.1.2 ALTERNATIVE DESIGN CONCEPT NOISE MODEL DEVELOPMENT METHODOLOGY

Development of the AEDT noise model for each alternative design concept started with the baseline noise model input, and modifications were made primarily to the noise model tracks to account for the alternative procedure design. The primary objective was to modify the baseline input to account for relocating flights that are expected to operate on a proposed RNAV procedure design concept. All other variables, such as aircraft type, operation levels, runway use, origin/destination, and FAA ATC vector patterns, would remain the same between the baseline and alternative modeled scenarios. The methodology focused on two elements: (1) modifying RNAV noise model track geometry to reflect an alternative design concept; and (2) assigning an appropriate level of operations to the proposed design concept model tracks.

Baseline noise model tracks representing RNAV procedures were selected based on the following criteria:

- Runway 27 Arrivals from the Northwest – baseline noise model tracks following the COMIX RNAV STAR flight path between the LNTRN and KLOMN waypoints
- Runway 27 Nighttime Departures to the Northwest – baseline nighttime noise model tracks following the PADRZ or CWARD RNAV SID flight path from Runway 27 to the WNFLD waypoint or the GWYNN waypoint
- Runway 27 Daytime Departures to the East – baseline daytime noise model tracks following the ZZOOO RNAV SID flight path from Runway 27 to the ZZOOO waypoint

[21] The average annual day (AAD) count was based on the total number of flights recorded in the ANOMS database between May 2017 and December 2017 divided by 244 days.

Because an RNAV SID does not exist for nighttime (10:00 p.m. to 6;30 a.m.[22]) departures to the east from Runway 27, no baseline noise model track represents an RNAV procedure for eastbound nighttime departures. A new noise model flight track was developed.

Baseline noise model tracks representing RNAV procedures were correlated with a corresponding proposed alternative design concept. For example, the baseline noise model track representing the COMIX RNAV STAR was linked to Recommendation 16, Alternative 1 Version 3, and departures between 10:00 p.m. and 6:30 a.m. from Runway 27 on the PADRZ RNAV SID were linked to Recommendation 14, Alternative 1 Version 2 and Recommendation 14, Alternative 4. The geometry for each baseline noise model track correlated with an alternative design concept was modified to represent the expected alternative design concept flight path. The FAA's TARGETS flight evaluator paths for each alternative design concept served as a reference in modifying the baseline noise model tracks. Starting with the baseline noise model track provided the ability to maintain consistency between the baseline and alternative scenarios (e.g., initial runway departure heading to the right from Runway 27, arrival track dispersion after passing the KLOMN waypoint to join the final approach to Runway 27).

For Runway 27 departures between 10:00 p.m. and 6:30 a.m. to the east, a new noise model track was developed using the PADRZ RNAV SID noise model tracks as a reference for the initial departure heading and the FAA's TARGETS flight evaluator path as a reference to locate the remainder of the backbone track after the first fly-by waypoint. Based on the proposed design, the noise model track dispersion assumed no more than 0.5 NM of dispersion along the left and right side of the backbone after the first fly-by waypoint.

Two options were related to assigning operations to the alternative design concept noise model tracks: (1) assign all operations (flights following an RNAV procedure, conventional procedures, or FAA ATC radar vectors) to an alternative design concept noise model track; or (2) assign only those operations on the baseline RNAV procedures to the alternative design concept noise model track. The first option assumes the FAA ATC will assign all flights to the alternative design procedure and will not vector the traffic off the procedure at any point. This assumption would provide both a higher level of decrease or increase in CNEL result compared to assigning only those operations that were on the existing RNAV procedure. The first option assumption is very unlikely to occur due to the FAA ATC's need to dynamically manage traffic to maintain an efficient and safe system. As a result, the decreases identified would be overestimated. The second option assumes the use of an alternative design concept would be the same as the existing RNAV procedure use. The advantage to this option is the ability to quantify the change in CNEL based only on relocating the RNAV track, and not possibly overestimating the potential decrease and increase in CNEL by assuming FAA ATC management techniques, such as radar vectoring, would continue. For purposes of this noise screening analysis, the second option was used to allocate operations to the alternative design concept noise model tracks.

There were three exemptions related to maintaining existing RNAV use. The first exception was distributing operations to the Runway 27 departures between 10:00 p.m. and 6:30 a.m. to the east (Recommendation 15, Alternative 2 Version 2 and Recommendation 15, Alternative 4). Because no RNAV procedure was in the baseline, 80 percent of all jet departures to the east between 10:00 p.m. and 6:30 a.m. were assigned to the noise model tracks representing Recommendation 15, Alternative 2 Version 2 and Recommendation 15, Alternative 4. The remaining 20 percent were maintained on the baseline noise model tracks. This allocation assumes the FAA ATC will keep 80 percent on the RNAV up to the ZZOOO waypoint and will issue radar vectors for 20 percent of the traffic.

[22] There is a departure curfew between 11:30 p.m. and 6:30 a.m. If a departure happens to occur during curfew hours, the proposed procedure would be preferred during the curfew hours.

The second exemption was assigning more arrival operations to Recommendation 16, Alternative 1 Version 3. There were several FAA ATC radar vectored operations located over the same path as the proposed final design concept route for Recommendation 16 Alternative 1. The arrival operations were assigned the proposed design RNAV noise model tracks because the flights were already following the same flight path. This resulted in a higher percentage use of the RNAV path compared to baseline use of the current COMIX RNAV STAR. The third exemption was assigning more departure operations to Recommendation 15 Alternative 1. There were several FAA ATC radar vectored departures located over the same path as the proposed final design concept route. Those departure operations were assigned the proposed design RNAV noise model tracks.

In addition to noise model track geometry, altitude controls for Recommendation 16, Alternative 1 were adjusted to reflect the intended design. Altitude controls were necessary to model the alternative design departure concepts, but only used to ensure noise energy for aircraft at or above 10,000 feet is included in calculated CNEL for grids located within the community areas of focus.

The alternative AEDT models included the same terrain (provided by USGS), the average weather conditions (temperature, humidity, and air pressure) observed at SDIA in 2017, and the uniformed closely spaced grid points, used in the baseline AEDT model. The CNEL was calculated for each uniformed closely spaced grid points. The CNEL was compared to the baseline CNEL at each grid to determine potential decreases and increases resulting from implementing a proposed design concept alternative.

6.3.1.3 ALTERNATIVE NOISE SCREENING MODEL SCENARIOS

The objective of the screening analysis was to quantify potential increases and decreases in CNEL for each alternative design concept. The method used to achieve the objective was to develop alternative scenarios in AEDT that represent each alternative design concept and to compare the results to the baseline AEDT results. Some of the alternative design concepts are not mutually exclusive and should be combined in one scenario to capture the total CNEL where both concepts share a common flight path. For example, Recommendation 14, Alternative 1 Version 2 shares the same initial departure flight path to the first fly-by waypoint with Recommendation 15, Alternative 2 Version 2. Therefore, both alternative design concepts should be modeled together. This is also the case with Recommendation 14, Alternative 4 and Recommendation 15, Alternative 4. **Table 6-3** lists the alternative noise screening model scenarios developed in AEDT, as well as the alternative design concepts included in each scenario.

TABLE 6-3 ALTERNATIVE NOISE SCREENING MODEL SCENARIOS

SCENARIO	ALTERNATIVE DESIGN CONCEPTS	JUSTIFICATION
Scenario 1: Runway 27 Nighttime Departures – Fly By Waypoint 2.0 NM from Shoreline	▪ Recommendation 14 Alternative 1 Version 2 ▪ Recommendation 15 Alternative 2 Version 2	Accounts for cumulative CNEL levels along flight path shared by both designs from Runway 27 to the first fly-by waypoint
Scenario 2: Runway 27 Nighttime Departures – Fly By Waypoint 0.5 NM from Shoreline	▪ Recommendation 14 Alternative 4 ▪ Recommendation 15 Alternative 4	Accounts for cumulative CNEL levels along flight path shared by both designs from Runway 27 to the first fly-by waypoint
Scenario 3: Runway 27 Daytime Eastbound Departures	▪ Recommendation 15 Alternative 1	Does not share a common flight path with other alternative design concepts
Scenario 4: Runway 27 Arrivals from Northwest	▪ Recommendation 16 Alternative 1 Version 3	Does not share a common flight path with other alternative design concepts

NOTES:
Daytime – 6:30 a.m. to 9:59 p.m.
Nighttime – 10:00 p.m. to 6:30 a.m. There is a departure curfew between 11:30 p.m. and 6:30 a.m. If a departure happens to occur during curfew hours, the proposed procedure would be preferred during the curfew hours.
NM – Nautical Miles
CNEL – Community Noise Exposure Level
SOURCE: Ricondo & Associates, Inc., January 2019.

6.3.2 NOISE SCREENING RESULTS BY SCENARIO

The noise screening results focused on changes in CNEL caused by implementing the proposed final design concepts. Calculated changes at or above 1 CNEL dBA for closely-spaced grids located within the focused community areas were identified. For reference, most people begin to detect a change in noise when levels increase or decrease by 3 dBA. The Team recognized some individuals are more sensitive to noise; therefore, decided to identify changes at or above 1 dBA. The following sections describe the CNEL changes calculated for each modeled scenario.

6.3.2.1 SCENARIO 1 - RECOMMENDATION 14 ALTERNATIVE 1/RECOMMENDATION 15 ALTERNATIVE 2

Scenario 1 modified jet departures between 10:00 p.m. and 6:30 a.m.[23] heading northwest and east from Runway 27 to follow the same initial runway heading used for the PADRZ RNAV SID up to a waypoint, AN14-1, just past 1.5 NM west of the shoreline. Application of the same initial heading used for the PADRZ RNAV SID was intended to ensure no changes in CNEL levels for areas currently exposed to CNEL 65 dBA or higher. At the waypoint, northwest departures turned towards the west to BROCK2 waypoint to stay further south of the La Jolla area (Recommendation 14 Alternative 1). Jet departures heading east would follow an RNAV path towards the ZZOOO waypoint (Recommendation 15 Alternative 2). Currently, there is no RNAV SID procedure for eastbound jet departures assigned to the initial right turn heading from Runway 27.

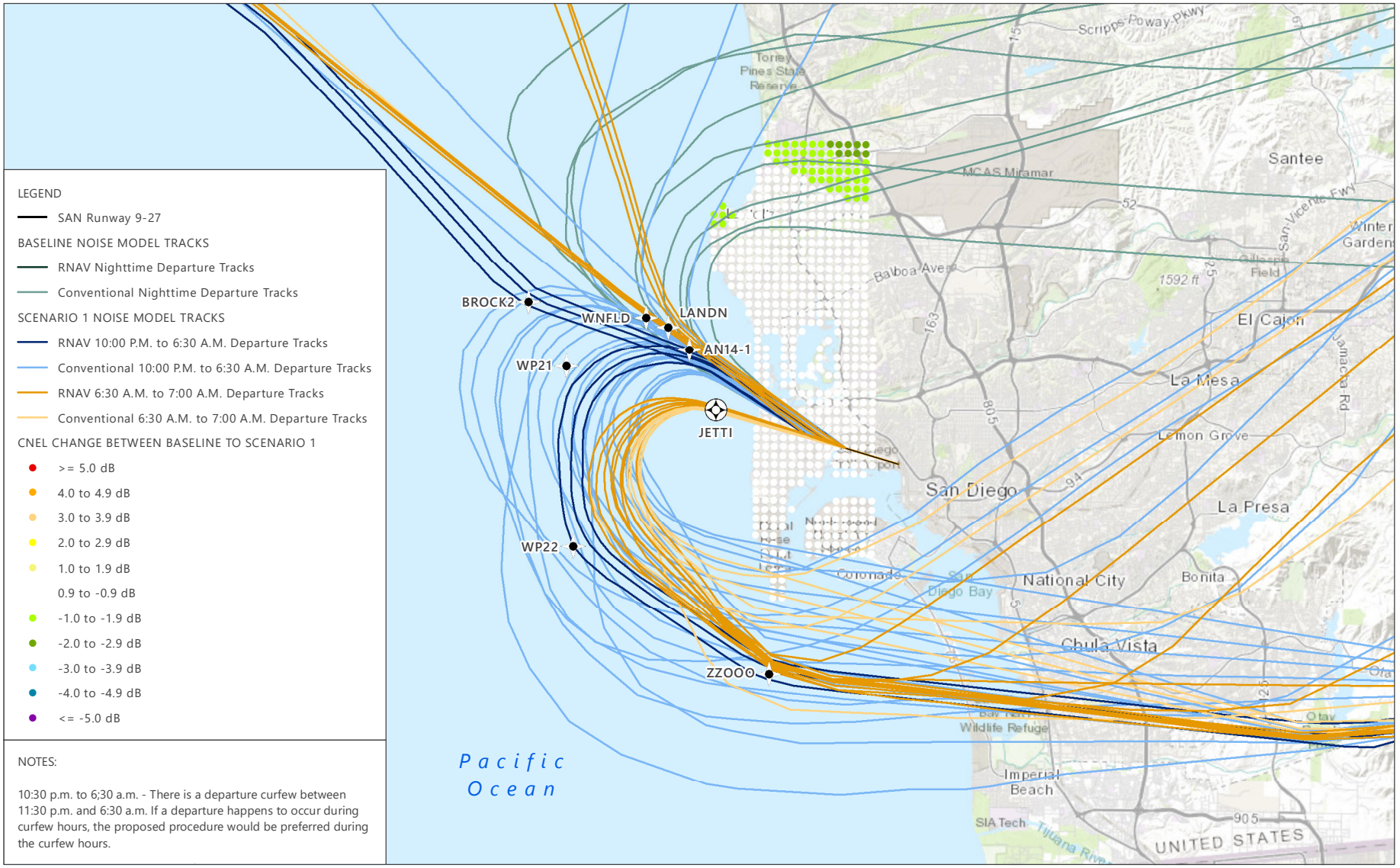
Exhibit 6-1 depicts the baseline and Scenario 1 noise model tracks related to the proposed final design concept with operations between 10:00 p.m. and 6:59 a.m. and the calculated changes equal to or higher than 1 CNEL dBA. The noise model tracks depicted on Exhibit 6-1 indicate expected flight paths between 10:00 p.m. and 6:30 a.m. (blue noise model tracks) and 6:30 a.m. to 6:59 a.m. (orange noise model tracks). For clarity purposes, the noise model tracks with daytime and evening departure noise model tracks and daytime, evening and nighttime arrival noise model tracks from the northwest were not depicted on Exhibit 6-1, but were included in the model input to calculate the CNEL levels at each grid point. **Exhibit 6-2** provides a closer look at those grids with changes equal to or higher than 1 CNEL dBA.

The results indicated CNEL levels within La Jolla near the shoreline may expect a decrease between 1 and 2 CNEL dBA. The cause for the change were attributed to two factors:

1. All jet departures between 10:00 p.m. and 6:30 a.m.[24] that turn right and proceed to the east over La Jolla would now turn left and follow the proposed ANAC 15 Recommendation Alternative 2 RNAV departure path.
2. Jet departures between 10:00 p.m. and 6:30 a.m. headed to the northwest would be further south of La Jolla, which increases the point of closest approach distance from La Jolla.

[23] There is a departure curfew between 11:30 p.m. and 6:30 a.m. If a departure happens to occur during curfew hours, the proposed procedure would be preferred during the curfew hours.

[24] There is a departure curfew between 11:30 p.m. and 6:30 a.m. If a departure happens to occur during curfew hours, the proposed procedure would be preferred during the curfew hours.

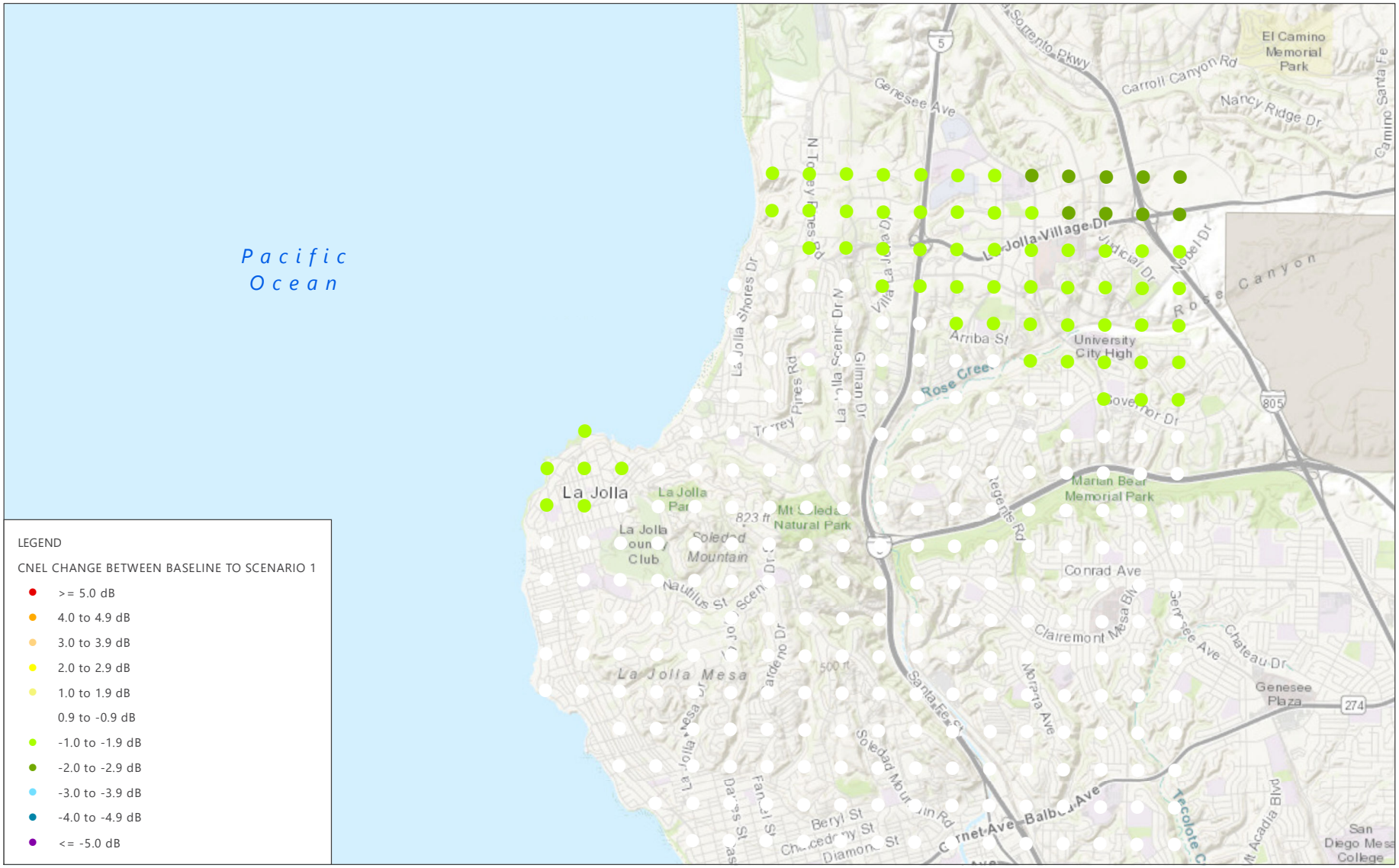


SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (AEDT noise model flight tracks, closely-spaced grid points, calculated CNEL changes, and final design concept waypoints); Federal Aviation Administration, March 2019 (current RNAV SID waypoints).

EXHIBIT 6-1

SCENARIO 1 AND BASELINE NOISE MODEL TRACKS
(BETWEEN 10:00 P.M. AND 6:59 A.M.) WITH CNEL CHANGES

P:\GIS\Projects\SAN\MXD\SAN_Ex6-1_Scenario1_Baseline_Tracks-CNELChanges_20190416.mxd



SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (closely-spaced grid points, calculated CNEL changes, and final design concept waypoints).

EXHIBIT 6-2

NORTH 0 6,000 ft

CHANGES IN CNEL - NORTH OF SDIA

P:\GIS\Projects\SAN\MXD\SAN_Ex6-2_Scenario1_CNELChangesNorthofSDIA_20190416.mxd

Of the two factors, the primary contributor to the decrease in CNEL levels for the grid points identified on Exhibit 6-1 was the change in eastbound departures that turn right and proceed over La Jolla. The decreases between 2 and 3 CNEL dBA north of La Jolla Village Dr (La Jolla Commons area) were all attributed to the change in eastbound departures between 10:00 p.m. and 6:30 a.m. There were decreases in CNEL levels just below 1 dBA among several grid points along the western shoreline of La Jolla attributed to both factors.

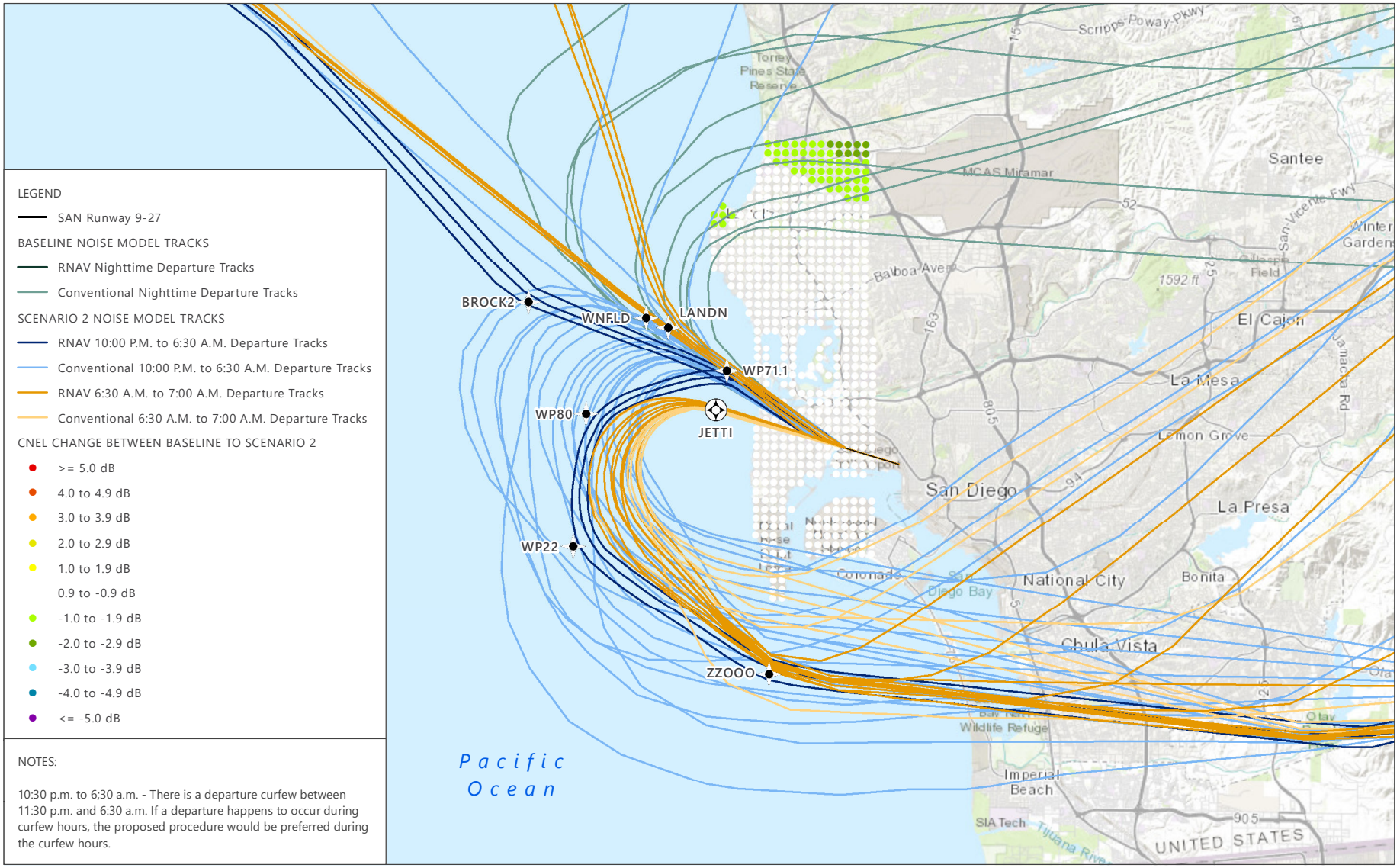
Scenario 1 included the proposed final design concept for ANAC 15 Alternative 2 for departures between 10:00 p.m. and 6:30 a.m. heading to the east towards the ZZOOO waypoint. The change in CNEL levels within the Point Loma area did not exceed 1 CNEL dBA, but there were decreases in CNEL below 1 dBA with the southern area of Point Loma. Eighty-one percent of all jet departures on the nighttime noise abatement heading that turn left to the south then east were modeled on the proposed final design RNAV SID. The remaining 19 percent followed the same FAA ATC radar vector patterns observed in the baseline model. If the proposed final design concept was implemented in addition to ANAC Recommendation 15 Alternative 1 (Extend JETTI waypoint 2 NM further west), it is possible a reduction in CNEL levels equal to or above 1 CNEL dBA may occur within the Point Loma area.

6.3.2.2 SCENARIO 2 - RECOMMENDATION 14 ALTERNATIVE 4/RECOMMENDATION 15 ALTERNATIVE 4

Scenario 2 modified jet departures between 10:00 p.m. and 6:30 a.m.[25] heading northwest and east from Runway 27 to follow the same initial runway heading used for the PADRZ RNAV SID up to waypoint, WP71.1 located approximately 0.5 NM west of the shoreline. Application of the same initial heading used for the PADRZ RNAV SID was intended to ensure no changes in CNEL levels for areas currently exposed to CNEL 65 dBA or higher. At the waypoint, northwest departures turned towards the west to BROCK2 waypoint to stay further south of the La Jolla area. (Recommendation 14 Alternative 1). Jet departures heading east would follow an RNAV path towards the ZZOOO waypoint (Recommendation 15 Alternative 2). Currently, there is no RNAV SID procedure for eastbound jet departures assigned to the initial right turn heading from Runway 27.

Exhibit 6-3 depicts the baseline and Scenario 2 noise model tracks related to the proposed final design concept with operations between 10:00 p.m. and 6:59 a.m. and the calculated changes equal to or higher than 1 CNEL dBA. The noise model tracks depicted on Exhibit 6-3 indicate expected flight paths between 10:00 p.m. and 6:30 a.m. (blue noise model tracks) and 6:30 a.m. to 6:59 a.m. (orange noise model tracks). For clarity purposes, the noise model tracks with daytime and evening departure noise model tracks and daytime, evening and nighttime arrival noise model tracks from the northwest were not depicted on Exhibit 6-3 but were included in the model input to calculate the CNEL levels at each grid point. **Exhibit 6-4** provides a closer look at those grids with changes equal to or higher than 1 CNEL dBA.

[25] There is a departure curfew between 11:30 p.m. and 6:30 a.m. If a departure happens to occur during curfew hours, the proposed procedure would be preferred during the curfew hours.

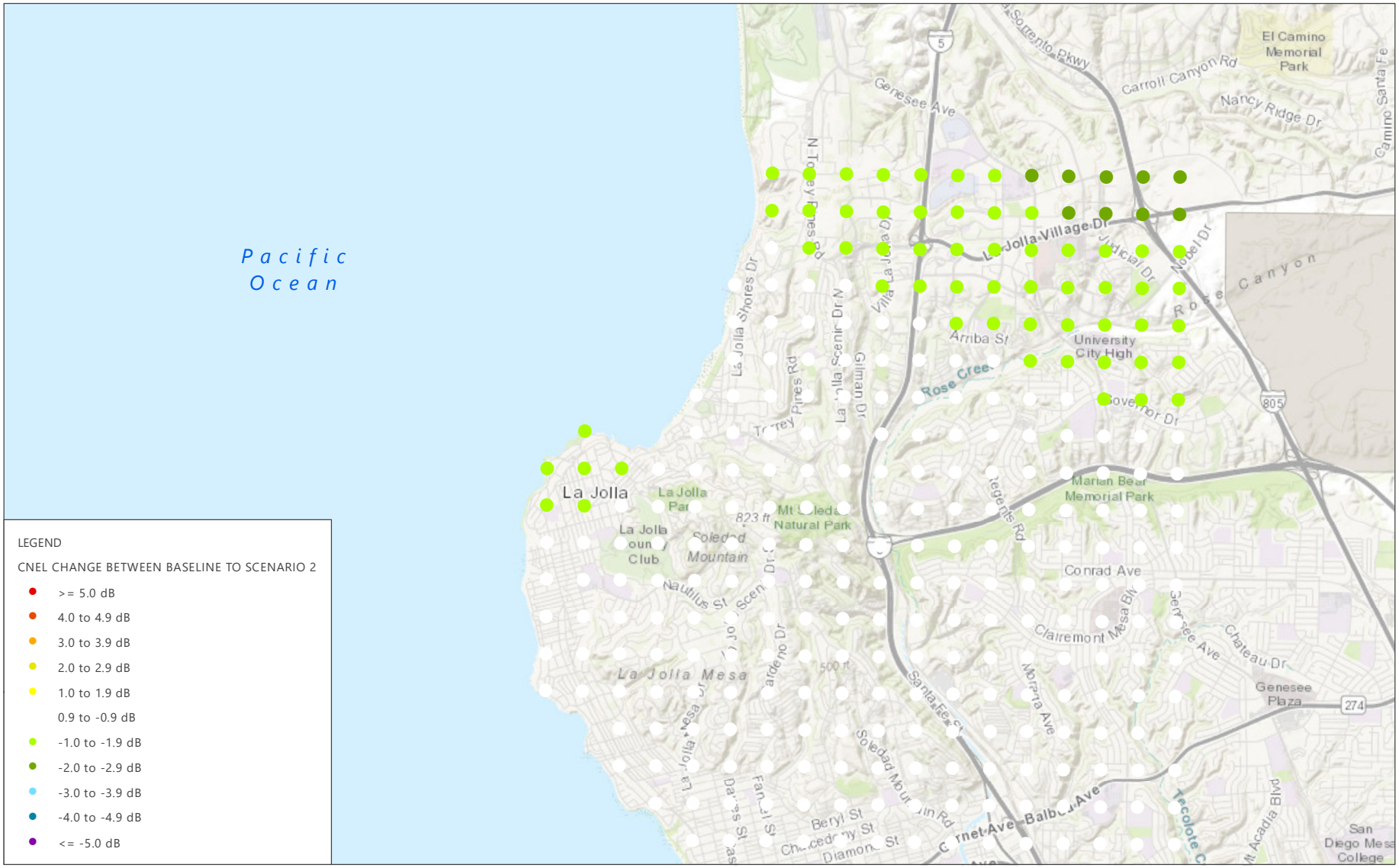


SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (AEDT noise model flight tracks, closely-spaced grid points, calculated CNEL changes, and final design concept waypoints); Federal Aviation Administration, March 2019 (current RNAV SID waypoints).

EXHIBIT 6-3

SCENARIO 2 AND BASELINE NOISE MODEL TRACKS
(BETWEEN 10:00 P.M. AND 6:59 A.M.) WITH CNEL CHANGES

P:\GIS\Projects\SAN\MXD\SAN_Ex6-3_Scenario2_Baseline_Tracks-CNELChanges_20190416.mxd



SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (closely-spaced grid points, calculated CNEL changes, and final design concept waypoints).

EXHIBIT 6-4

NORTH 0 6,000 ft

CHANGES IN CNEL - NORTH OF SDIA

P:\GIS\Projects\SAN\MXD\SAN_Ex6-4_Scenario2_CNELChangesNorthofSDIA_20190416.mxd

The results indicated CNEL levels within La Jolla near the shoreline may expect a decrease between 1 and 2 CNEL dBA. The cause for the change were attributed to two factors:

1. All jet departures between 10:00 p.m. and 6:30 a.m. that turn right and proceed to the east over La Jolla would now turn left and follow the proposed ANAC 15 Recommendation Alternative 2 RNAV departure path.
2. Jet departures between 10:00 p.m. and 6:30 a.m. headed to the northwest would be further south of La Jolla, which increases the point of closest approach distance from La Jolla.

Of the two factors, the primary contributor to the decrease in CNEL levels for the grid points identified on Exhibit 6-3 was the change in eastbound departures that turn right and proceed over La Jolla. The decreases between 2 and 3 CNEL dBA north of La Jolla Village Dr (La Jolla Commons area) were all attributed to the change in eastbound departures at night. There were decreases in CNEL levels just below 1 dBA among several grid points along the western shoreline of La Jolla attributed to both factors.

Scenario 2 included the proposed final design concept for ANAC 15 Alternative 4 for departures between 10:00 p.m. and 6:30 a.m. heading to the east towards the ZZOOO waypoint. The change in CNEL levels within the Point Loma area did not exceed 1 CNEL dBA, but there were decreases in CNEL below 1 dBA with the southern area of Point Loma. Eighty-one percent of all jet departures on the nighttime noise abatement heading that turn left to the south then east were modeled on the proposed final design RNAV SID. The remaining 19 percent followed the same FAA ATC radar vector patterns observed in the baseline model. There were decreases in CNEL below 1 dBA with the southern area of Point Loma. If the proposed final design concept was implemented in addition to ANAC Recommendation 15 Alternative 1 (Extend JETTI waypoint 2 NM further west), it is possible a reduction in CNEL levels equal to or above 1 CNEL dBA may occur within the Point Loma area.

6.3.2.3 SCENARIO 3 – RECOMMENDAITON 15 ALTERNATIVE 1

Scenario 3 modified the ZZOOO RNAV SID, which directs jet aircraft to the south thence to the east from Runway 27. Instead of turning south after flying over the JETTI waypoint, departures continue a 275 magnetic heading until passing over the GATTO waypoint. The GATTO waypoint is 2.0 NM further west of the JETTI waypoint. The intent was to move jet departures further west of the Point Loma peninsula shoreline and raise the altitude as aircraft fly by the ZZOOO waypoint. FAA ATC radar vectoring was assumed to continue under Scenario 3. The Team assumed the design would not mitigate all the reasons why FAA ATC may issue radar heading vectors to maintain safe separation. Aircraft that were radar vectored further west prior to turning south were added to the proposed RNAV SID design, but the remaining radar vector patterns identified would not be subject to change as a result of implementing the proposed design. The only restriction to FAA ATC when issuing radar vectored headings is to stay on the initial departure heading until 1.5 NM west of the shoreline and stay south of two noise dots to avoid residential areas north of the Fort Rosecrans Cemetery. Therefore, the Team concluded radar vector patterns observed in the baseline would remain the same for Scenario 3. Approximately 84 percent of eastbound departures from Runway 27 were flown along the ZZOOO RNAV SID path up to the ZZOOO waypoint. The remaining 16 percent were directed by FAA ATC. The Scenario 3 model not only maintained the 84 percent on the proposed design concept path, but also included traffic from the baseline that were in the same area as the proposed design concept path. This resulted in 87 percent use of the proposed design concept path. The remaining 13 percent of eastbound departures were kept on the non-RNAV noise model tracks.

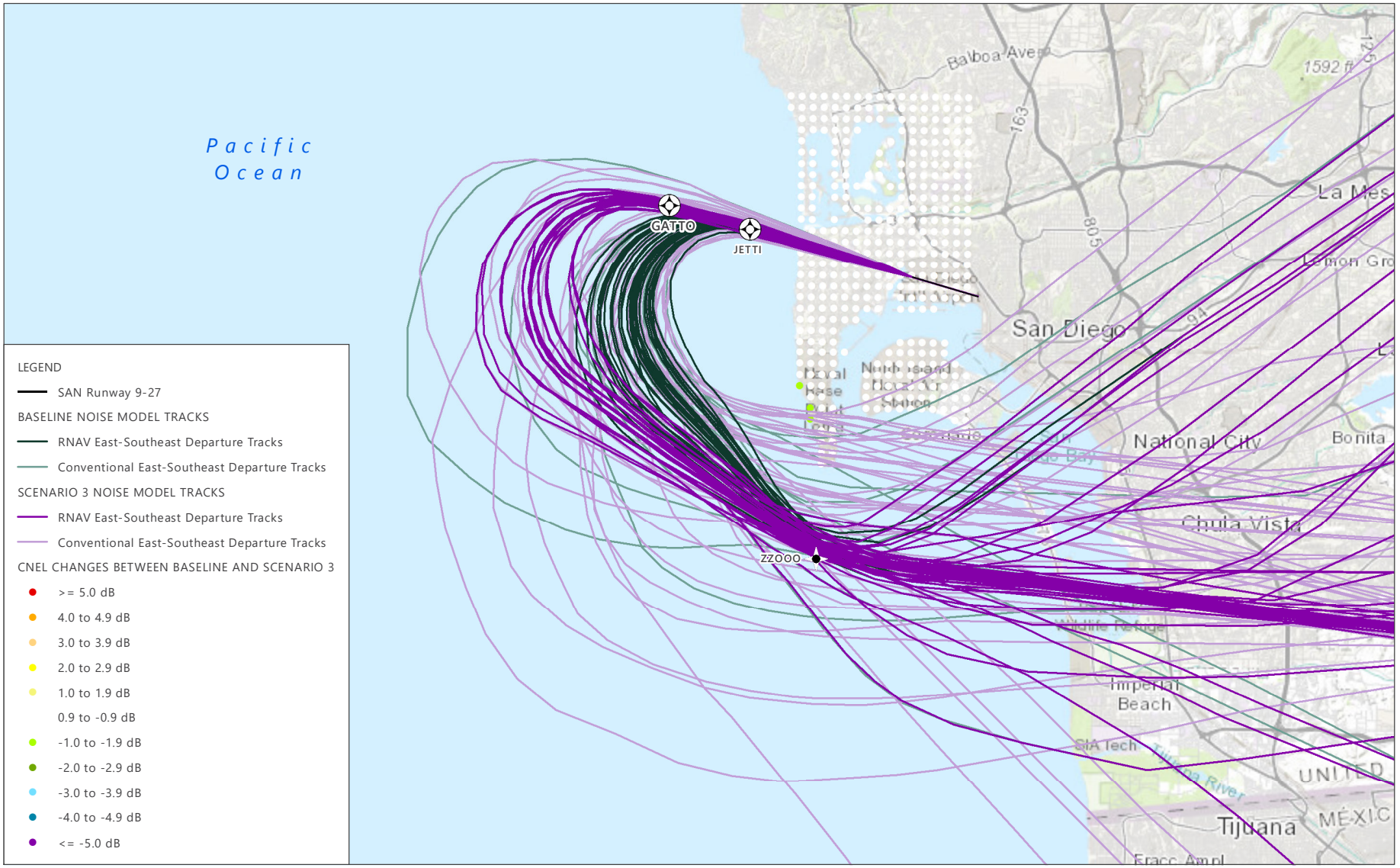
Exhibit 6-5 depicts the baseline noise model tracks, Scenario 3 noise model tracks and calculated changes equal to or higher than 1 CNEL dBA. For clarity purposes, the departure noise model tracks on the initial right turn heading from Runway 27 and arrival noise model tracks from the northwest were not depicted on Exhibit 6-5 but were included in the model input to calculate the CNEL levels at each grid point. The noise model tracks depicted on Exhibit 6-5 are the noise model tracks related to the proposed final design concept for Scenario 3. **Exhibit 6-6** provides a closer look at those grids with changes equal to or higher than 1 CNEL dBA.

The results indicated CNEL levels within Point Loma near the shoreline may expect a decrease between 1 and 2 CNEL dBA. The decrease was attributed to increasing the distance between the shoreline and jet traffic turning south after passing the GATTO waypoint. Several grid points located in the southern portion of the Point Loma peninsula did indicate a reduction, but did not exceed 1 CNEL dBA. If the proposed final design concept was implemented in addition to ANAC Recommendation 15 Alternative 2 (Fly By Turn at 1.5 NM from Shoreline then to ZZOOO Waypoint (Nighttime)) or Alternative 4 (Fly By Turn between Shoreline and 1.5 NM from Shoreline then to ZZOOO Waypoint (Nighttime)), it is possible a reduction in CNEL levels equal to or just above 1 CNEL dBA may occur within the southern portion of the Point Loma peninsula.

6.3.2.4 SCENARIO 4 –RECOMMENDATION 16 ALTERNATIVE 1

Scenario 4 modified the COMIX RNAV STAR, which directs Runway 27 jet aircraft arrivals from the northwest from the LNTRN waypoint to the southeast to the XMANS waypoint thence to the east to the KLOMN waypoint. Instead of heading southeast towards XMANS waypoint, the proposed final design path directs jet arrivals to the intersection of I-805 and SR-52 thence to the KLOMN waypoint. The COMIX RNAV STAR requires aircraft to be at or above 9,000 feet MSL near LNTRN waypoint. The proposed final design concept required aircraft to be at or above 8,000 feet MSL near the LNTRN waypoint. The lower altitude was required to avoid aircraft performance issues during speed reduction and descent. Aircraft were modeled at or above 6,000 feet MSL at the KLOMN waypoint for both Scenario 3 and the baseline model. The intent was to move jet arrivals further north away from residents in the La Jolla area and closer to the Torrey Pines Golf Course. Approximately 65 percent of jet arrivals from the northwest to Runway 27 were flown along the COMIX RNAV STAR path up to the KLOMN waypoint. The remaining 35 percent were issued radar vector headings by FAA ATC. The Scenario 4 model not only maintained the 65 percent on the proposed design concept path, but also included traffic from the baseline that were in the same area as the proposed design concept path. This resulted in 75 percent use of the proposed design concept path up to the KLOMN waypoint. The remaining 25 percent were kept on the non-RNAV noise model tracks identified for the baseline.

Exhibit 6-7 depicts the baseline noise model tracks, Scenario 4 noise model tracks and calculated changes equal to or higher than 1 CNEL dBA. For clarity purposes, the departure noise model tracks from Runway 27 were not depicted on Exhibit 6-5 but were included in the model input to calculate the CNEL levels at each grid point. The noise model tracks depicted on Exhibit 6-7 are the noise model tracks related to the proposed final design concept for Scenario 4. **Exhibits 6-8** and **6-9** provide a closer look at those grids with changes equal to or higher than 1 CNEL dBA along the coastline and inland, respectively.



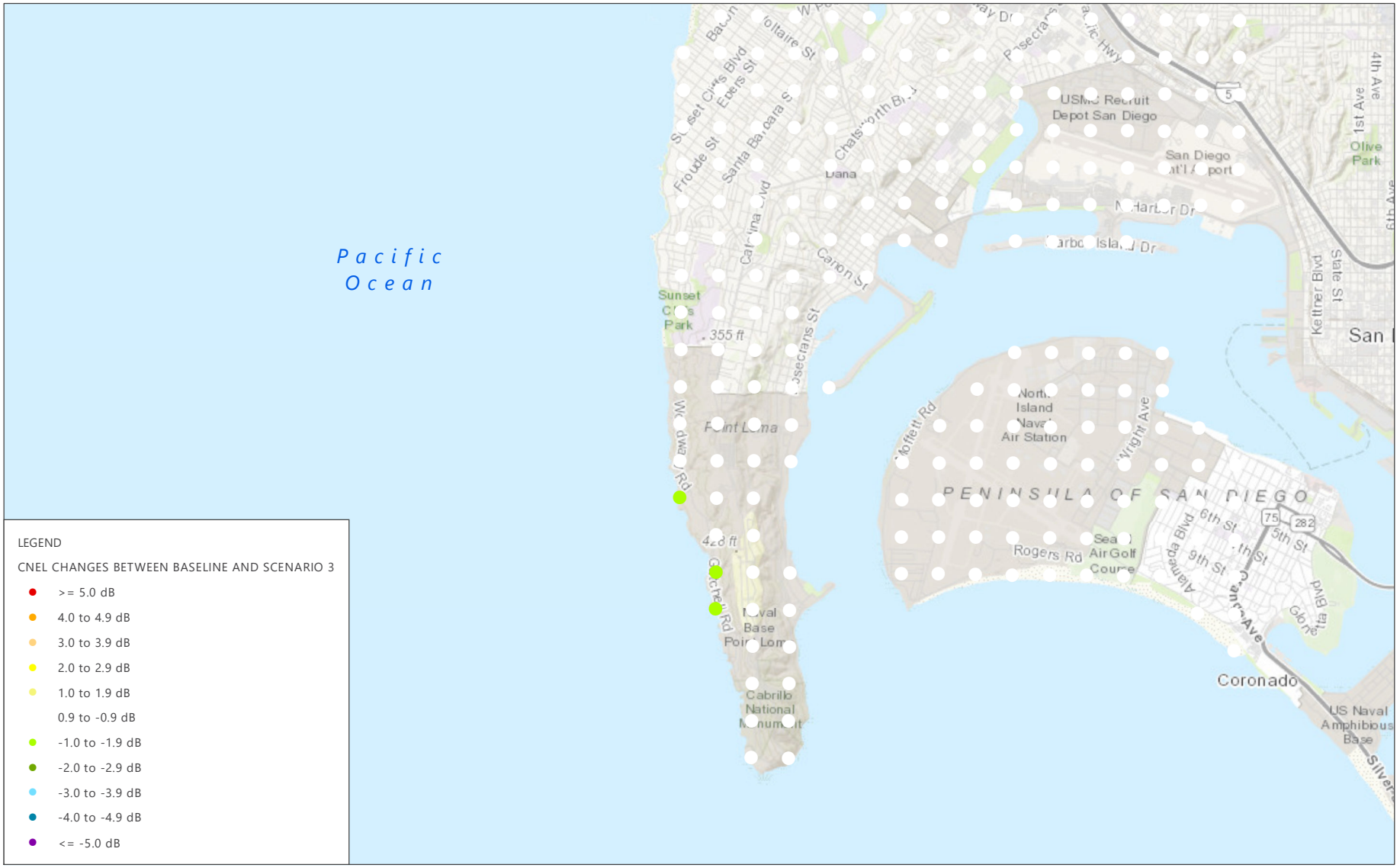
SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (AEDT noise model flight tracks, closely-spaced grid points, calculated CNEL changes, and final design concept waypoints); Federal Aviation Administration, March 2019 (current RNAV SID waypoints).

NORTH 0 20,000 ft

EXHIBIT 6-5

SCENARIO 3 AND BASELINE NOISE MODEL TRACKS WITH CNEL CHANGES

P:\GIS\Projects\SAN\MXD\SAN_Ex6-5_Scenario3_Baseline_Tracks_CNELChanges_20190416.mxd



LEGEND

CNEL CHANGES BETWEEN BASELINE AND SCENARIO 3

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

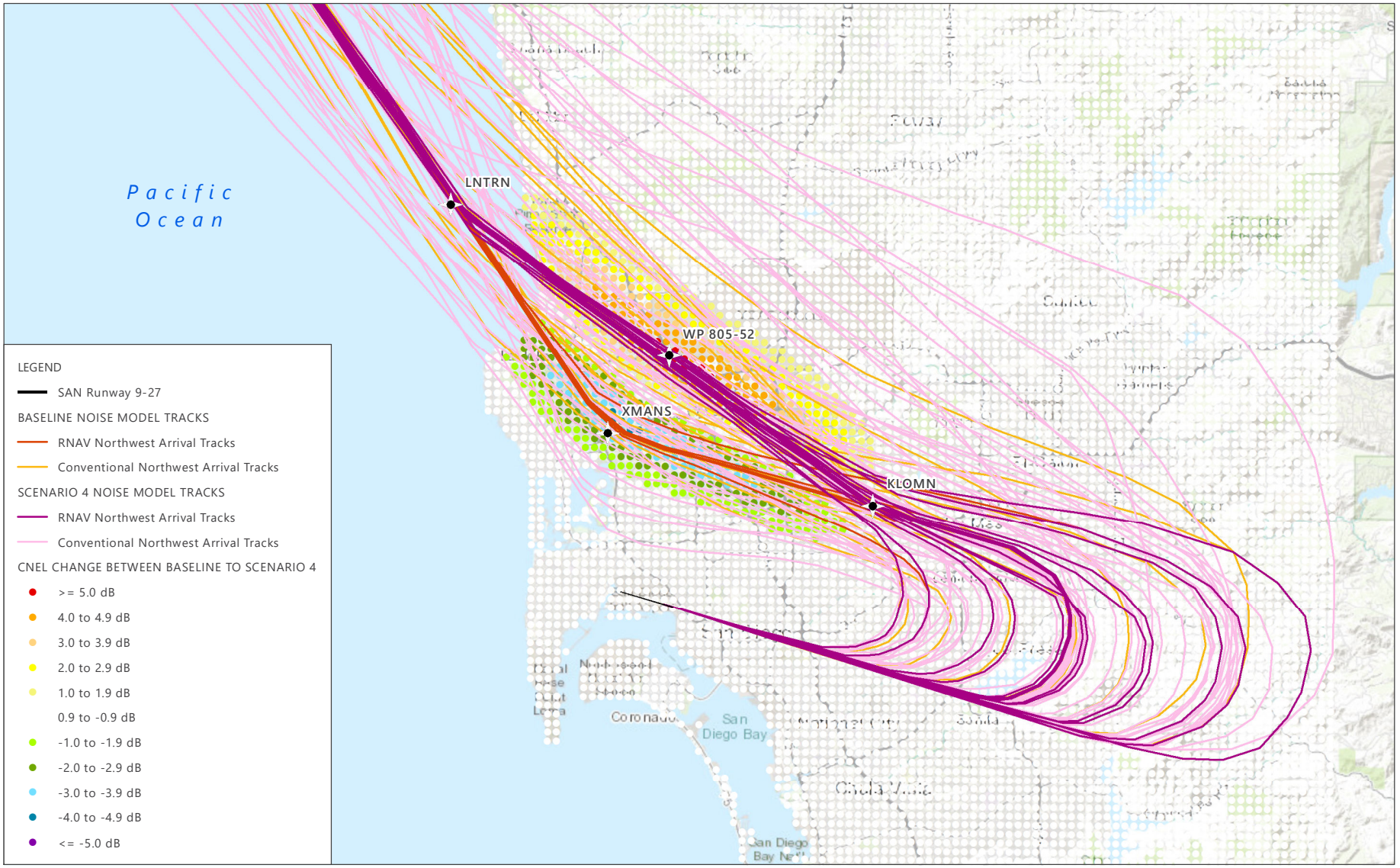
SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (closely-spaced grid points, calculated CNEL changes, and final design concept waypoints).

EXHIBIT 6-5

NORTH 0 6,000 ft

CHANGES IN CNEL - SOUTH OF SDIA

P:\GIS\Projects\SAN\MXD\SAN_Ex6-6_Scenario3_CNELChangesSouthofSDIA_20190416.mxd



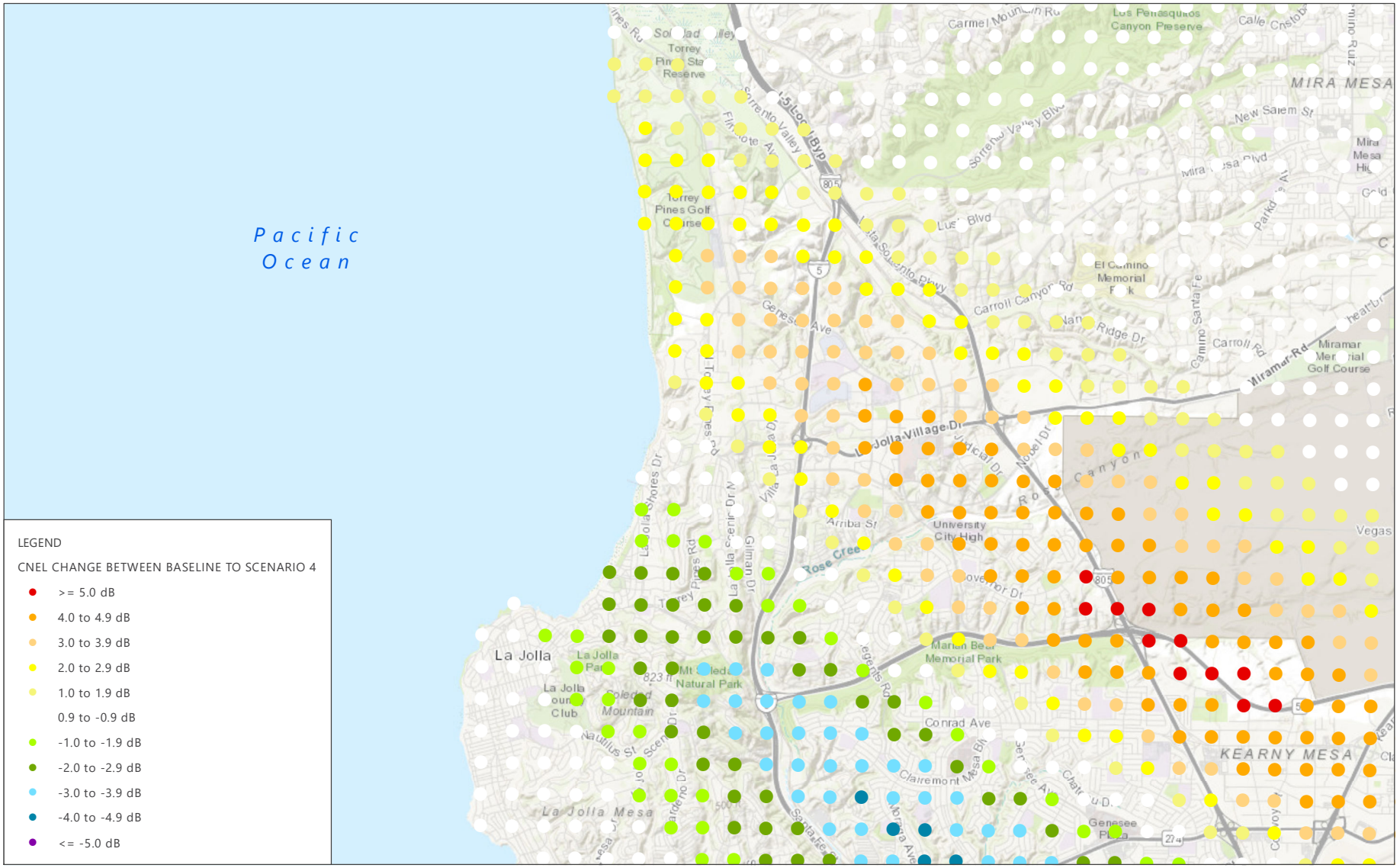
SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (AEDT noise model flight tracks, closely-spaced grid points, calculated CNEL changes, and final design concept waypoints); Federal Aviation Administration, March 2019 (current RNAV SID waypoints).

NORTH 0 25,000 ft

EXHIBIT 6-7

SCENARIO 4 AND BASELINE NOISE MODEL TRACKS WITH CNEL CHANGES

P:\GIS\Projects\SAN\MXD\SAN_Ex6-7_Scenario4_Baseline_Tracks_CNELChanges_20190416.mxd



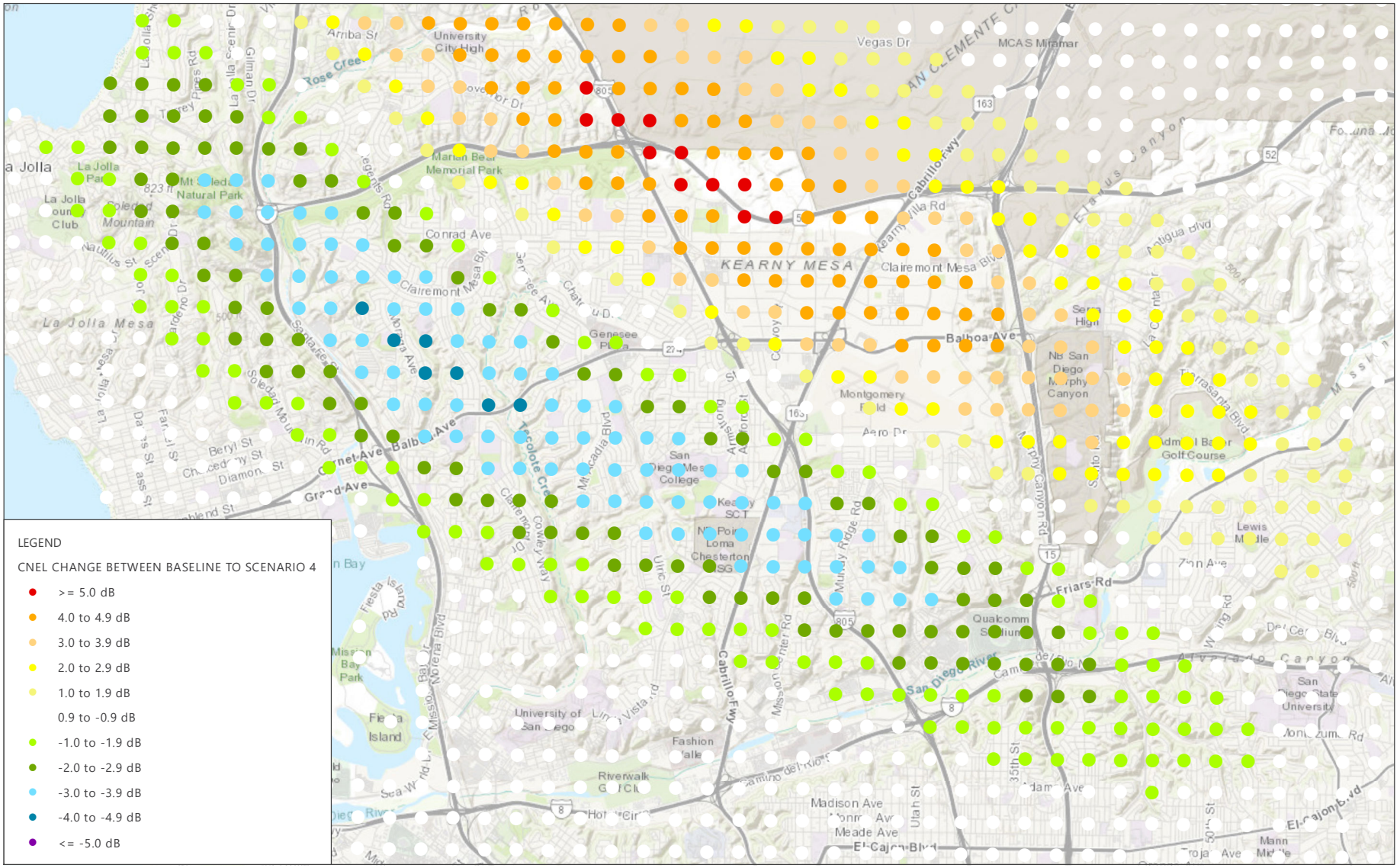
SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (closely-spaced grid points, calculated CNEL changes, and final design concept waypoints).

EXHIBIT 6-8

NORTH 0 7,000 ft

CHANGES IN CNEL - COASTLINE

P:\GIS\Projects\SAN\MXD\SAN_Ex6-8_Scenario4_CNELChangesCoastline_20190416.mxd



SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (closely-spaced grid points, calculated CNEL changes, and final design concept waypoints).

EXHIBIT 6-9

NORTH 0 7,000 ft

CHANGES IN CNEL - INLAND

P:\GIS\Projects\SAN\MXD\SAN_Ex6-9_Scenario4_CNELChangesInland_20190416.mxd

The results indicated CNEL levels increases as high as 5 CNEL dBA and decreases just under 5 CNEL dBA throughout northern San Diego. The changes in CNEL were attributed to moving 65 percent of all jet arrivals from the northwest from the current COMIX RNAV STAR flight path to the proposed Recommendation 16 Alternative 1 final design flight path. The change in flight path accomplished the intent to reduce CNEL levels within La Jolla. The change also provided a reduction over areas such as Clairemont and Clairemont Mesa. Although, the change in flight path would increase CNEL levels to noticeable levels over areas such as the University of California San Diego, University City and Kearny Mesa. If implemented, it is reasonable to expect residents located underneath the proposed path will notice an increase in overflights. Based on the noise screening results, achieving a reduction in noise for the La Jolla area by the relocation of the jet arrival flight path will cause a noticeable increase in noise for other communities.

6.4 FINAL DESIGN CONCEPT REVIEW AND INPUT

Initial noise screening analysis results and initial recommendations were presented to TAC and CAC on March 28, 2019. Operation assumptions were refined for Recommendation 14 Alternatives 1 and 4, and updated screening results were provided to TAC and CAC on May 23, 2019 at a joint TAC/CAC meeting. In addition, the Team reviewed comments provided by TAC and CAC members after the March 28, 2019 meeting, and revised recommendations based on input provided. Appendix B includes presentations for both meetings, and includes responses to the comments provided by members after the March 28, 2019 meeting.

6.4.1 TECHNICAL ADVISORY COMMITTEE INPUT AT MARCH 28, 2019 MEETING

Draft noise model screening results were presented to the TAC on March 28, 2019. Some TAC members indicated concerns with recommending a procedure design that does not include the nighttime noise abatement heading of 290 magnetic degrees. The current version of Recommendation 14 Alternative 1, Recommendation 14 Alternative 4, Recommendation 15 Alternative 2 and Recommendation 15 Alternative 4 included the existing initial departure heading pattern observed for PADRZ RNAV SID traffic. Some TAC members indicated the existing PADRZ RNAV SID heading differs from the expected nighttime noise abatement 290 magnetic heading.

Members representing users indicated concerns related to the increased flight distance and fuel burn as a result of extending the ZZOOO SID route as proposed for Recommendation 15 Alternative 1. The expected decrease in CNEL did not appear to provide a level of benefit compared to the costs associated with increasing the flight distance. The same members indicated concerns related to making it through the FAA process and meeting FAA's mission and goals. The Team shared the same concerns, but indicated the concerns were not substantial enough to conclude with certainty the design or a modification of it would not be accepted by the FAA.

6.4.2 CITIZEN ADVISORY COMMITTEE INPUT AT MARCH 28, 2019 MEETING

Draft noise model screening results were presented to the CAC on March 28, 2019. Some TAC members indicated concerns with recommending a procedure design that does not include the nighttime noise abatement heading of 290 magnetic degrees. The current version of Recommendation 14 Alternative 1, Recommendation 14 Alternative 4, Recommendation 15 Alternative 2 and Recommendation 15 Alternative 4 included the existing initial departure heading pattern observed for PADRZ RNAV SID traffic. Some CAC members indicated the existing PADRZ RNAV SID heading differs from the expected nighttime noise abatement 290 magnetic heading, and indicated concerns related to increasing noise over Mission Beach residents. The Team proposed an option to CAC to put the proposed designs on hold until Recommendation 17 (Nighttime Noise Abatement Heading) and Recommendation 21 (Engineering Study on Nighttime Noise Abatement) are addressed as part of the Title 14 CFR Part 150 process. Comments from CAC members after the meeting emphasized the importance to address the nighttime noise abatement heading and should be included as part of the proposed designs related to departures between 10:00 p.m. and 6:30 a.m.

Some CAC members indicated concerns related to the Team's radar vector assumptions for Recommendation 15 Alternative 1. The members indicated that the intent for Recommendation 15 was to reduce FAA ATC radar vectoring. The Team explained to members that radar heading vectors will always occur as needed to ensure safe and efficient movement of aircraft. A procedure design would not prevent FAA's ability to issue radar vector headings. The Team believed current radar vector patterns observed for current conditions would continue if Recommendation 15 Alternative 1 was implemented. There was no indication from FAA that the proposed design would reduce or eliminate the need to radar vector aircraft as needed to ensure safe separation.

6.4.3 JOINT TAC AND CAC MEETING ON MAY 23, 2019

A final meeting was conducted on May 23, 2019 with both TAC and CAC in attendance. As a result of discussions at the March 28, 2019 meeting, the Team identified an incorrect operations assignment to Recommendation 14 Alternative 1 and 4 noise model tracks and presented updated screening results for Scenario 1 and 2 at the May 23, 2019 meeting. In addition, the Team requested further input from all members on the initial departure heading and the preservation of the early turn restriction related to the nighttime jet departure design concepts. The Team recommended the nighttime jet departure design concept that turns jet aircraft at approximately a half nautical mile from the shoreline because it provided the farthest distance from La Jolla even though the reduction in noise was not substantially higher compared to the design with the fly-by turn at 1.5 nautical miles. This design would remove the early turn restriction for departures between 10:00 p.m. and 6:30 a.m. Each member provided input and recommended to maintain the early turn restriction at 1.5 nautical miles from the shoreline.

The Team summarized multiple comments provided by TAC and CAC members related to the initial departure heading, and discussed two options:

1. Continue forward with considering the proposed concept design.
2. Hold the proposed concept design from further consideration until ANAC 17 and 21 are addressed in the Title 14 CFR Part 150 Study.

Members from both committees indicated concerns with moving forward with a procedure design without reconciling the preferred noise abatement path at night; therefore, TAC and CAC recommended to hold the proposed concept designs until Recommendations 17 and 21 are addressed. The Team indicated the design concepts may need to be modified to accommodate the recommended nighttime noise abatement alternative.

7. FINAL RECOMMENDATIONS

Based on the technical analysis and input from the TAC and CAC, the Team recommended three design concepts:

- Recommendation 14 Alternative 1 Version 2– Nighttime Jet Departure[26] to the Northwest – Turn at 1.5 NM
- Recommendation 15 Alternative 2 Version 2 – Nighttime Jet Departure to the East[27] – Turn at 1.5 NM
- Recommendation 15 Alternative 1 – Jet Departures to the East (6:30 a.m. to 10:00 p.m.)

The Team recommends not to proceed forward with the jet arrivals from the northwest design concept (Recommendation 16 Alternative 1 Version 3). Two design concepts, Recommendation 14 Alternative 4 (Nighttime Jet Departure to the Northwest- Turn at 0.5 NM) and Recommendation 15 Alternative 4 (Nighttime Jet Departure to the East – Turn at 0.5 NM) are similar to the two recommended nighttime jet departure design concepts listed above. The primary difference was the distance from the shoreline where jet departures may turn off the initial departure heading. Only one turning point location can be selected. Based on TAC and CAC preference to maintain the early turn restriction at 1.5 NM, the proposed design concepts that turn aircraft a half nautical mile from the shoreline was not recommended. The following sections summarize the Team's reasons for the recommendations.

7.1 NIGHTTIME JET DEPARTURE TO THE NORTHWEST – TURN AT 1.5 NM

The Team recommended the Nighttime Jet Departure to the Northwest – Turn at 1.5 NM design concept. The concept design increases distance between aircraft and La Jolla and maintains the early turn restriction. A critical feature of the design concept was to maintain the current RNAV-based initial departure flight paths from Runway 27 during nighttime noise abatement hours. The current design and TARGETS flight evaluator indicated jet departures would follow the current PADRZ RNAV SID path to the waypoint were aircraft begin the turn at 1.5 NM.

The aircraft noise screening results did not indicate a decrease in CNEL equal to or higher than 1 CNEL dBA for the La Jolla area as a result of implementing the design concept, but indicated decreases in CNEL levels close to 1 CNEL dBA as a result of increasing the distance between northbound jet departures and La Jolla during nighttime hours (10:00 p.m. to 6:30 a.m.).

Based on input from TAC and CAC, the Team recommended putting further consideration on hold until ANAC Recommendation 17 and 21 are addressed under the Title 14 CFR Part 150 process. If a nighttime noise abatement heading is recommended, the design will need to be updated to accommodate the proposed initial departure noise abatement path.

7.2 NIGHTTIME JET DEPARTURE TO THE EAST – TURN AT 1.5 NM

The Team recommended the Nighttime Jet Departure to the East – Turn at 1.5 NM concept design. The concept design increases distance between aircraft and La Jolla and maintains the early turn restriction. The design also

[26] Nighttime for the proposed procedures is between 10:00 p.m. and 6:30 a.m. There is a departure curfew between 11:30 p.m. and 6:30 a.m. If for any reason a departure occurs during the curfew, the flight is expected to be assigned the proposed procedure.

[27] Nighttime for the proposed procedures is between 10:00 p.m. and 6:30 a.m. There is a departure curfew between 11:30 p.m. and 6:30 a.m. If for any reason a departure occurs during the curfew, the flight is expected to be assigned the proposed procedure.

increases the distance between aircraft and the western shoreline of the Point Loma Peninsula. It directs aircraft towards the ZZOOO waypoint and keeps jet departures south of Point Loma.

Aircraft noise screening results indicated a decrease between 1 and 2 CNEL dBA in the La Jolla area as a result of directing eastbound jet departures south thence east to the ZZOOO waypoint instead of turning right thence over La Jolla. The screening results did not indicate a decrease in CNEL equal to or higher than 1 CNEL dBA for the Point Loma area, but there were decreases in CNEL levels close to 1 dBA along the southern area of Point Loma. The Team recommends proceeding with an RNAV SID for eastbound departures assigned the nighttime noise abatement procedure, which does not currently exist. Implementing an RNAV SID that routes jet departures between 10:00 p.m. to 6:30 a.m. to the ZZOOO waypoint will reduce the need for FAA ATC to issue radar vector headings.

This design shares the same initial departure route as the Nighttime Jet Departure to the Northwest – 1.5 NM design concept. The design concept maintained the current RNAV-based initial departure flight paths from Runway 27 during nighttime noise abatement hours. The current design and TARGETS flight evaluator indicated jet departures would follow the current PADRZ RNAV SID path to the waypoint were aircraft begin the turn at 1.5 NM..

Based on input from TAC and CAC, the Team recommends putting further consideration on hold until ANAC Recommendation 17 and 21 are addressed under the Title 14 CFR Part 150 process. If a nighttime noise abatement heading is recommended, the design will need to be updated to accommodate the proposed initial departure noise abatement path.

7.3 NIGHTTIME JET DEPARTURE TO THE NORTHWEST – TURN AT 0.5 NM

The Team did not recommend proceeding forward with the Nighttime Jet Departure to the Northwest – Turn at 0.5 NM based on TAC and CAC input. This design provided the greatest increase in distance between the procedure route and residents in the La Jolla area compared to the Nighttime Jet Departure to the Northwest – Turn at 1.5 NM design, but did not maintain the early turn restriction preferred by CAC members.

7.4 NIGHTTIME JET DEPARTURE TO THE EAST – TURN AT 0.5 NM

The Team did not recommend proceeding forward with the Nighttime Jet Departure to the East – Turn at 0.5 NM based on TAC and CAC input. This design provided the greatest increase in distance between the procedure route and residents in the La Jolla area compared to the Nighttime Jet Departure to the East – Turn at 1.5 NM design, but did not maintain the early turn restriction preferred by CAC members..

7.5 JET DEPARTURES TO THE EAST (6:30 A.M. TO 10:00 P.M.)

The Team recommended proceeding forward with Recommendation 15 Alternative 1. The aircraft noise screening results indicated a decrease between 1 and 2 CNEL dBA along the Point Loma peninsula shoreline by moving the eastbound jet departures further west as aircraft proceed south prior to turning left to the east. Several grid points located in the southern portion of the peninsula indicated reductions close to 1 CNEL dBA. Based on a qualitative assessment, the combination of the Jet Departures to the East and Nighttime Jet Departures to the East – Turn at 1.5 NM could reduce CNEL levels between 1 and 2 dBA for the southern portion of the Point Loma peninsula.

The primary concern with the Jet Departures to the East concept design was the increase in flight distance. During the formal review process, FAA will determine if the proposed concept impacts FAA's ability to meet their mission

and goals. The FAA, along with airline input, will weigh the benefits versus the potential impacts (e.g., increased time and workload in sector, fuel burn). A reduction between 1 and 2 CNEL may not be enough to overcome the costs associated with additional fuel burn or potential impact in managing traffic in an efficient manner comparable to existing conditions.

7.6 ALL DAY JET ARRIVALS FROM THE NORTHWEST

The Team recommended not to proceed forward with the All Day Jet Arrvials from the Northwest design concept due to the potential for substantial increase in aircraft noise levels for areas such as the University of California San Diego, University City and Kearny Mesa. Increasing noise exposure levels over one community to decrease noise for another community is not an effective noise abatement approach. The Team was also concerned with the operational feasibility of the design based on user input. Concerns related to meeting required descent altitudes and speed reductions continued to exist by members of TAC who represent users.

7.7 ANAC PRESENTATION AND RECOMMENDED ACTIONS

The Ricondo Team presented the final recommendations to ANAC on June 19, 2019. A copy of the presentation is provided in Appendix B. The Team presented an overview of the traffic procedure evaluation process; a description of the final design concepts; the aircraft noise screening results for each final design concept, and the Team's recommendations. The Team requested ANAC to consider the following actions:

- Hold the Nighttime Departure to the Northwest and East concept designs for ANAC 14 and 15 from further consideration until ANAC 17 and 21 are addressed as part of the 14 CFR Part 150 Study Update process.
- Proceed forward with the Jet Departures to the East (6:30 a.m. to 10:00 p.m.) for further consideration (ANAC 15).
- Proceed forward with Noise Dot #4 and #5 relocation for further consideration (ANAC 20).

ANAC considered the actions and concurred with the Team's recommendations.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A

Basics of Air Traffic Control

APPENDIX A BASICS OF AIR TRAFFIC CONTROL

The Air Traffic Flight Procedure Evaluation (Flight Procedure Evaluation) report often references air traffic control (ATC); therefore, the best way to understand the information presented in the report is to have a basic understanding of ATC requirements. This appendix provides basic background information on the National Airspace System (NAS), the role of ATC, the aircraft flow within the NAS, the type of ATC facilities, ATC requirements, and the Federal Aviation Administration's (FAA's) Next Generation Air Transportation System (NextGen)[28] program.

A.1 NATIONAL AIRSPACE SYSTEM

Under the Federal Aviation Act of 1958 (49 U.S.C. § 40101 et seq.), the FAA was delegated control over use of the nation's navigable airspace and the regulation of domestic civil and military aircraft operations in the interest of maintaining safety and efficiency.[29] To help fulfill this mandate, the FAA established the NAS. Within the NAS, the FAA provides air traffic services for aircraft takeoffs, landings, and the flow of aircraft between airports through a system of infrastructure (e.g., ATC facilities), people (e.g., air traffic controllers, maintenance, and support personnel), and technology (e.g., radar, communications equipment, and ground-based navigational aids [NAVAIDs[30]]). The NAS is governed by various FAA rules and regulations. The NAS comprises one of the most complex aviation networks in the world. The FAA continuously reviews the design of all NAS resources to ensure they are effectively and efficiently managed. The FAA Air Traffic Organization (ATO) is the primary organization responsible for managing airspace and flight procedures in the NAS. When changes are proposed to the NAS, the FAA works to ensure the changes maintain or enhance system safety and improve efficiency. One way to accomplish this mission is to employ emerging technologies to increase system flexibility and predictability.[31]

A.2 AIR TRAFFIC CONTROL IN THE NATIONAL AIRSPACE SYSTEM

The combination of infrastructure, people, and technology used to monitor and guide (or direct) aircraft within the NAS is referred to collectively as ATC. It is the responsibility of ATC to maintain safety and to expedite the flow of traffic in the NAS by applying defined minimum distances or altitude between aircraft (referred to as "separation"). This is accomplished through required communications between air traffic controllers and pilots and the use of navigational technologies.

Described in Title 14 Code of Federal Regulations (CFR) Part 91, aircraft operate under two distinct categories of flight rules: Visual Flight Rules (VFR) and Instrument Flight Rules (IFR).[32] These flight rules generally correspond to

[28] The Next Generation Air Transportation System (NextGen) is a portfolio of multiple programs to modernize America's air transportation system to make flying even safer, more efficient, and more predictable.

[29] Title 49 United States Code, Section 40101(d)4.

[30] NAVAIDs are facilities that transmit signals that define key points or routes.

[31] U.S. Department of Transportation, Federal Aviation Administration, *FY 2018 Organizational Success Increase/Measures*, December 12, 2017, https://www.faa.gov/about/plans_reports/media/fy18_osi_osm.pdf (accessed September 12, 2018).

[32] Title 14 Code of Federal Regulations 91.151 through 91.193, "Visual Flight Rules" and "Instrument Flight Rules."

two categories of weather conditions: Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC).

VMC generally occur during fair to good weather, when good visibility conditions exist. IMC occur during periods when visibility falls to less than 3 statute miles or the cloud ceiling (i.e., the distance from the ground to the bottom layer of clouds, defined as the point where the clouds cover more than 50 percent of the sky) drops to lower than 1,000 feet, Correspondingly, a pilot is responsible to "see and avoid" under VFR to maintain safe separations from other aircraft and obstacles. IFR are designed for use when separation from other flying aircraft and terrain is maintained by cockpit instrument reference and radar separation. Under IFR, aircraft operators are required to file flight plans, maintain two-way radio communications, and use navigational instruments to operate within the NAS. Pilots must follow IFR during IMC. Regardless of weather conditions, most commercial air traffic operates under IFR.[33]

Depending on whether aircraft are operating under IFR or VFR, air traffic controllers apply various techniques to maintain defined minimum distances (referred to as separations) between aircraft,[34] including the following:

- **Vertical or "Altitude" Separation**: separation between aircraft operating at different altitudes
- **Longitudinal or "In-Trail" Separation**: separation between two aircraft operating along the same flight route, referring to the distance between a lead and a following aircraft
- **Lateral or "Side-by-Side" Separation**: separation between aircraft (left or right side) operating along two separate but nearby flight routes
- **Divergent Heading**: separation between two aircraft operating from the same runway must be going away from each other (diverging) at least at 15 degrees (or 10 degrees if both aircraft are assigned an RNAV procedure, previously termed as Equivalent Lateral Spacing Operations [ELSO]) from each other based on assigned (issued by ATC or indicated on a procedure) headings from the departure end of the runway

Air traffic controllers use radar to monitor aircraft and to provide services that ensure separation. Published instrument procedures provide pilots and controllers predictable, efficient routes that move aircraft through the NAS in a safe and orderly manner. These procedures reduce verbal communication between air traffic controllers and pilots.

Published instrument procedures may be categorized as conventional or Performance Based Navigation (PBN). Conventional procedures are predicated on ground-based NAVAIDs, while PBN utilizes satellite-based navigation and cockpit Flight Management Systems (FMS).[35]

In its effort to modernize the NAS, the FAA has implemented multiple instrument procedures that use advanced PBN technologies. A primary technology in this effort is Area Navigation (RNAV). RNAV uses technology, including

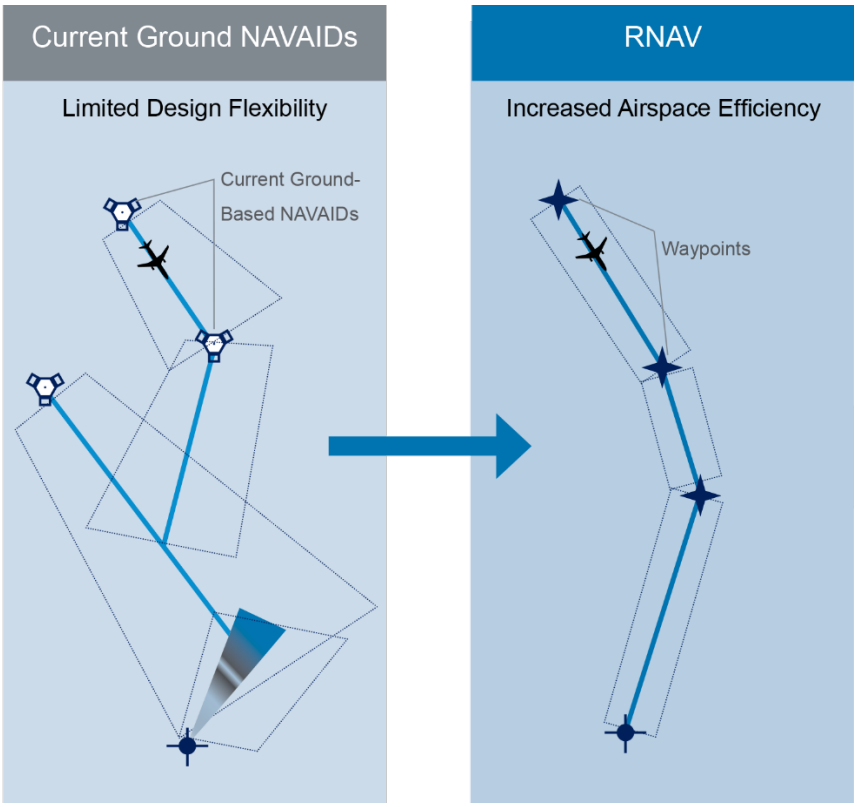
[33] Title 14 Code of Federal Regulations Part 121, "Operating Requirements: Domestic, Flag, and Supplemental Operations," October 2, 2018.

[34] Defined in FAA Order JO 7110.65X, *Air Traffic Control,* October 12, 2017.

[35] Flight Management System (FMS) is an onboard navigation system that includes a navigation database, positioning sensors, automatic flight guidance, and a flight management computer. As a system, it references the entered flight path, uses various sensors to determine the aircraft's position, and provides automatic flight guidance to fly the aircraft or to assist the pilot along the designated flight path laterally and vertically.

Global Positioning Satellites (GPS),[36] to allow an RNAV-equipped aircraft to fly a more efficient route that is not solely dependent upon ground-based NAVAIDS. This route is based on instrument guidance that references an aircraft's position relative to ground-based NAVAIDs or satellites. **Exhibit A-1** compares a conventional procedure to an RNAV procedure.

EXHIBIT A-1 COMPARISON OF ROUTES FOLLOWING CONVENTIONAL VERSUS RNAV PROCEDURES



NOTES:
NAVAIDS – Navigational Aids
RNAV – Area Navigation
SOURCE: U.S. Department of Transportation, Federal Aviation Administration, June 2016.

In addition to published instrument procedures, air traffic controllers use a variety of methods and coordination techniques to maintain safety and efficiency within the NAS:

- **Vectors**: FAA ATC issues directional headings to pilots to provide navigational guidance and to maintain separation between aircraft and/or obstacles.
- **Speed Control**: FAA ATC issues instructions to pilots to reduce or increase aircraft speed to maintain separation between aircraft.

[36] Global Positioning System (GPS) is a space-based radio-navigation system consisting of a constellation of satellites and a network of ground stations used for monitoring and control.

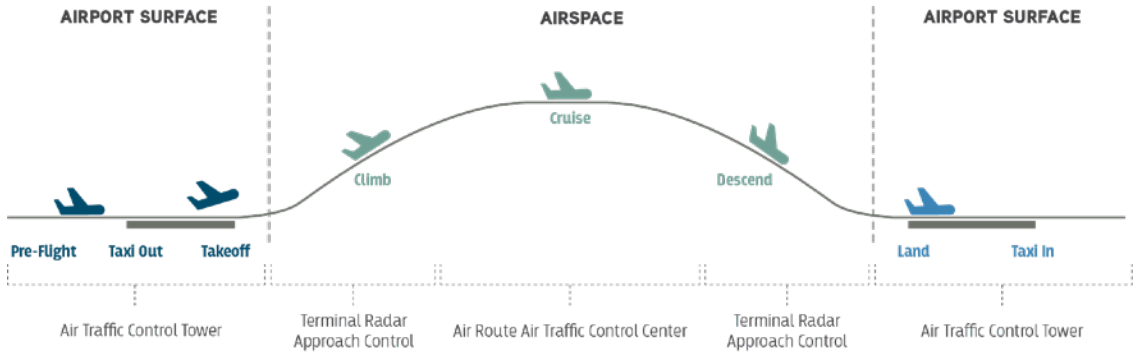
- **Reroute**: FAA ATC may change an aircraft's route for a variety of reasons, such as avoidance of inclement weather, to maintain separation between aircraft, and/or to protect airspace.
- **Point-out**: An FAA ATC controller issues a notification when an aircraft might pass through or affects another controller's airspace and radio communications will not be transferred.
- **Holding Pattern/Ground Hold**: FAA ATC controllers assign aircraft to a holding pattern in the air or hold aircraft on the ground before departure to maintain separation between aircraft and to manage arrival/departure volume.
- **Altitude Assignment/Level-off**: FAA ATC controllers assign altitudes to maintain separation between aircraft and/or to protect airspace. This may result in aircraft "leveling off" during ascent or descent.

A.3 AIRCRAFT FLOW IN THE NATIONAL AIRSPACE SYSTEM

As an aircraft moves from origin to destination, ATC personnel function as a team and transfer control of the aircraft from one controller to the next and from one ATC facility to the next. An aircraft traveling from airport to airport typically operates through six phases of flight (plus a "preflight" phase). **Exhibit A-2** depicts the typical phases of flight for a commercial aircraft. These phases include:

- **Preflight (Flight Planning)**: the preflight route planning and flight checks performed in preparation for takeoff
- **Pushback/Taxi/Takeoff**: the aircraft's transition across the airfield from pushback at the gate, taxiing to an assigned runway, and takeoff from the runway
- **Departure**: the aircraft's in-flight transition from takeoff to the enroute phase of flight, during which it climbs to the assigned cruising altitude
- **Enroute**: generally, the level segment of flight (i.e., cruising altitude) between the departure and destination airports
- **Descent**: the aircraft's in-flight transition from an assigned cruising altitude to the point at which the pilot initiates the approach to a runway at the destination airport
- **Approach**: the segment of flight during which an aircraft follows a standard procedure that guides the aircraft to the landing runway
- **Landing**: touchdown of the aircraft at the destination airport and taxiing from the runway to the gate or parking position

EXHIBIT A-2 TYPICAL PHASES OF A COMMERCIAL AIRCRAFT FLIGHT



SOURCE: Ricondo & Associates, Inc., February 2019.

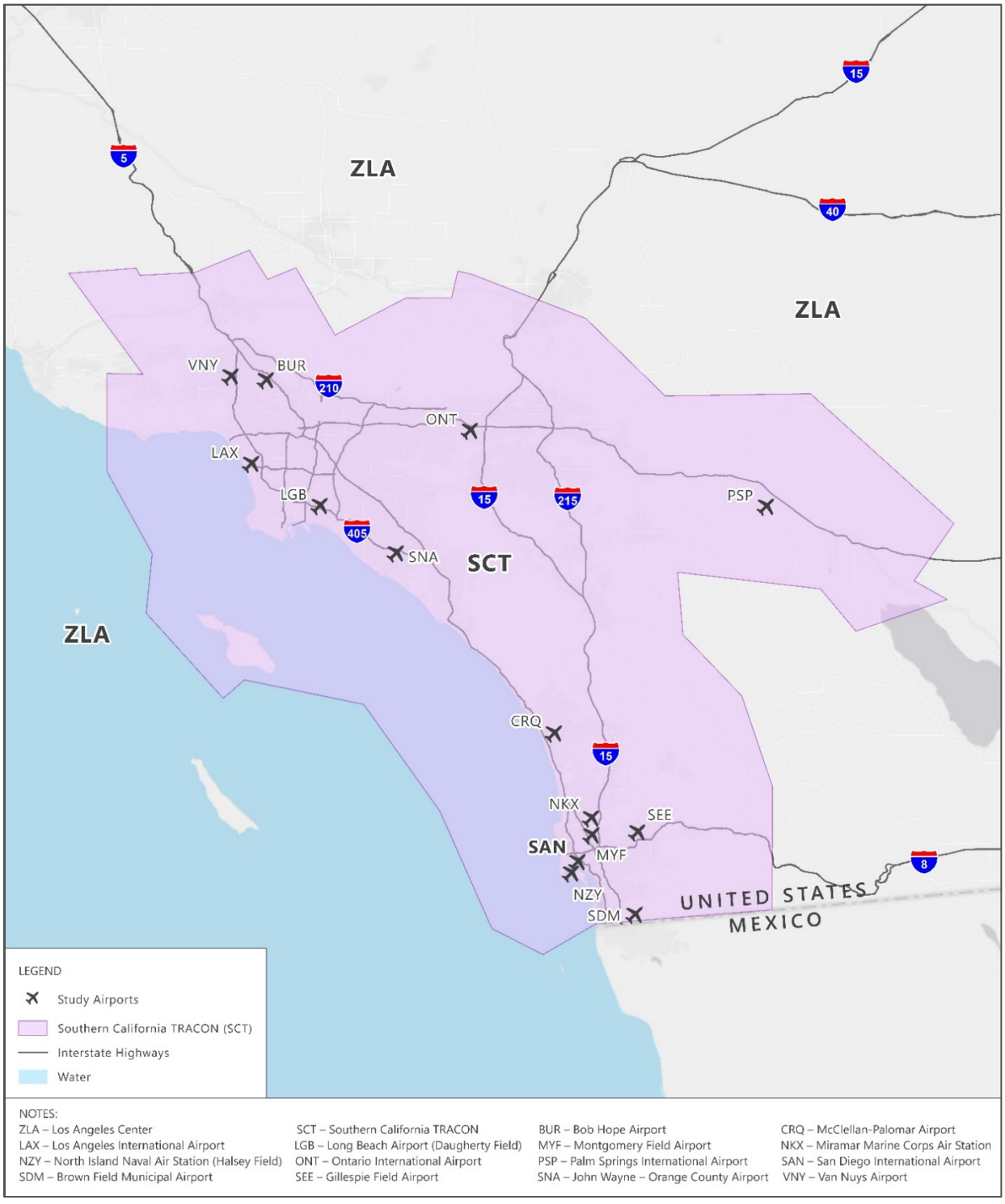
A.4 AIR TRAFFIC CONTROL FACILITIES IN THE NATIONAL AIRSPACE SYSTEM

Multiple FAA ATC facilities manage and coordinate the flow of traffic in the NAS. The NAS is organized into three-dimensional areas of navigable airspace that are defined by a floor, a ceiling, and a lateral boundary. Each is controlled by different types of ATC facilities:

- **Airport Traffic Control Tower**: Controllers at an Airport Traffic Control Tower (ATCT) located at an airport provide air traffic services for phases of flight associated with aircraft takeoff and landing (including final approach to runway). The ATCT typically controls airspace extending from the airport out to a distance of several miles. For San Diego International Airport (SDIA), the ATCT manages airfield taxiway movements, takeoff and landings on Runway 9-27, final approach to the runway, and initial departure headings from the runway. The Flight Procedure Evaluation seeks to evaluate design concepts that do not affect the ATCT's ability to manage traffic safely and efficiently, and it will not propose changes to ground control procedures and final approach or reduce available departure headings.
- **Terminal Radar Approach Control**: Controllers at a Terminal Radar Approach Control (TRACON) provide air traffic service to aircraft as they transition between an airport and the enroute phase of flight, as well as from the enroute phase of flight to an airport. This includes the departure, descent, and approach phases of flights. This part of the airspace managed by a TRACON is typically called the "terminal airspace." The TRACON airspace is broken down into sectors. As an aircraft moves between sectors, responsibility for it transfers from controller to controller. Air traffic controllers maintain separation between aircraft that operate within their sectors. The terminal airspace in the Southern California area, which includes SDIA traffic, is referred to as the Southern California TRACON (SCT TRACON) and is depicted on **Exhibit A-3**, with SDIA's location depicted for reference. SCT TRACON controllers provide air traffic services for terminal airspace from the surface to as high as 17,000 feet mean seal level[37] (MSL). ANAC Recommendations 14, 15, and 16 suggest flight procedure changes that are managed by SCT TRACON.

[37] Mean sea level is the altitude in feet compared to the average sea level (referenced with a 0 altitude).

EXHIBIT A-3 SOUTHERN CALIFORNIA TERMINAL RADAR APPROACH CONTROL (TRACON) AREA



SOURCE: Esri, HERE, Garmin, OpenStreetMap Contributors, and the GIS User Community, January 2019 (basemap); Natural Earth, 2019 (ocean); U.S. Census Bureau, Geography Division, TIGER/Line Shapefiles, 2019 (roads); U.S. National Atlas Airports, 2018 (airports); Federal Aviation Administration, February 2019 (SCT TRACON boundary)

- **Air Route Traffic Control Centers**: Air traffic controllers at Air Route Traffic Control Centers (ARTCCs or Centers) provide air traffic services during the departure phase outside of TRACON airspace, the enroute phase of flight, and the descent phase outside of TRACON airspace. Similar to TRACON airspace, the Center airspace is broken down into sectors. Within the study area for the Flight Procedure Evaluation, the Los Angeles Air Route Traffic Control Center (ZLA ARTCC) is responsible for departures and descents above and/or outside the delegated airspace to the SCT TRACON facility. This evaluation focuses on procedure designs within SCT TRACON airspace, and it will not change procedures that involve ZLA ARTCC control.

The following section provides an overview of how air traffic controllers at these ATC facilities control the phases of flight of IFR aircraft. The discussion is organized by departure flow, which includes the phases of flight from departure to enroute, and arrival flow, which includes the enroute to the descent and approach phases of flight.

A.4.1 DEPARTURE FLOW

As an aircraft operating under IFR, also known as an "IFR aircraft," departs a runway and follows its assigned heading, it moves from the ATCT airspace, through the terminal airspace, and into enroute airspace where it proceeds on a specific path[38] to its destination airport.

Within the terminal airspace, TRACON controllers provide services to aircraft departing from the ATCT airspace to transfer control points referred to as "exit points." An exit point represents an area along the boundary between terminal airspace and enroute airspace. Exit points are generally established near commonly used paths to efficiently transfer aircraft between terminal and enroute airspace. When aircraft pass through the exit point, control transfers from TRACON to ARTCC controllers.

At busy airports like SDIA, departing IFR aircraft use a procedure called a Standard Instrument Departure (SID). A SID provides pilots with defined lateral and vertical guidance to facilitate safe and predictable navigation from an airport through the terminal airspace to a specific high-altitude route in the enroute airspace. A "conventional" SID follows a route defined by ground-based NAVAIDs; it may be based on air traffic controller–issued headings or vectoring, or both. Because of the increased precision inherent in RNAV technology, an RNAV SID defines a more predictable path through the airspace than a conventional SID through the combination of GPS and aircraft FMS. Some RNAV SIDs may be designed to include routes called "runway transitions" that serve specific runways at airports. Transitions are a series of fixes leading to/from a common route. A runway transition serves as a defined route from a runway to join a specific point or commonly used route. A runway transition may be based on an ATCT-issued heading towards a waypoint or a well-defined route starting near the departure end of a runway. A SID may have several runway transitions serving one or more runways at one or more airports. After the runway transition, aircraft may operate along a common path before being directed along one or several diverging routes referred to as "enroute transitions." Enroute transitions may terminate at exit fixes or continue into enroute airspace where aircraft join a specific high-altitude route.

[38] FAA standard procedures refer to a line between two fix points (e.g., waypoints, fixes, or NAVAIDS) as a "route." FAA standard procedure plates depict the defined route. Procedure design may not translate to an aircraft located exactly on the route, especially if the route involves turns. For purposes of this evaluation, the expected location of an aircraft on a standard procedure is referred to as a "path." Differences between the definitions for "route" and "path" are applied to avoid confusion between the FAA's definition of a route and where aircraft are expected to be located.

A.4.2 ARRIVAL FLOW

An aircraft begins the descent phase of flight within the enroute airspace. During descent, the aircraft transitions into the terminal airspace through an "entry point" bound for the destination airport. The entry point represents a point along the boundary between terminal airspace and enroute airspace where control of the aircraft transfers from ARTCC to TRACON controllers.

Aircraft that arrive in a busy terminal airspace, like SCT TRACON, normally follow an instrument procedure called a Standard Terminal Arrival Route (STAR). Conventional and RNAV STARs are similar to conventional and RNAV SIDs. Aircraft leaving enroute airspace and entering terminal airspace may follow an enroute transition route from an entry fix to the STAR's common route in the terminal airspace. From the common route segment, aircraft may follow a runway transition route that directs aircraft along a path to a point near an airport or to a point where an instrument final approach starts (called the initial approach fix) before joining the final approach to an airport. The final approach is the segment of flight along which an aircraft is aligned with the landing runway and operates along a straight route at a constant descent rate to the runway. A STAR can also provide partial guidance through the terminal airspace (e.g., it may not include runway transitions, so air traffic controllers would vector aircraft to the final approach to a runway). To efficiently manage the merge of arrivals from multiple directions on to a final approach to a runway, air traffic controllers typically direct pilots to turn and descend at various locations. Once an aircraft is established on the final approach to a runway and is between 4 to 5 nautical miles (NM) from the runway, TRACON transfers control to ATCT. ATCT monitors the aircraft on final approach and clears the pilot to land on the runway.

A.5 AIR TRAFFIC CONTROL REQUIREMENTS

As controllers manage the flow of aircraft into, out of, and within the NAS, they maintain some of the following separation distances between aircraft[39]:

- **Altitude Separation** (vertical): When operating below 41,000 feet MSL, two aircraft must be at least 1,000 feet above/below each other until or unless lateral separation is ensured.
- **In-Trail Separation** (longitudinal): Within a radar-controlled area, the minimum distance between two aircraft on the same route (i.e., in-trail) can be between 2.5 and 10.0 NM, depending on factors such as aircraft class, weight, radar coverage, and type of airspace.
- **Side-by-Side Separation** (lateral): Similar to in-trail separation, the minimum side-by-side separation between aircraft must be at least 3.0 NM in terminal airspace and 5.0 NM in enroute airspace.
- **Visual Separation**: Aircraft may be separated by visual means when other approved separation is assured before and after the application of visual separation.

[39] For a detailed explanation of separation standards, see FAA Order 7110.65X, *Air Traffic Control*, October 12, 2017.

A.6 NEXTGEN PROGRAM OVERVIEW

NextGen is a portfolio of multiple programs to modernize America's air transportation system to make flying even safer, more efficient, and more predictable.[40] One of the NextGen programs is the PBN program, which is the FAA's long-term plan to modernize the NAS from a ground-based system of ATC to a GPS-based system of air traffic management that allows for the development of PBN procedures.[41] Achieving the NextGen system requires implementing RNAV and/or Required Navigation Performance (RNP)[42] PBN procedures to take advantage of readily available aircraft "auto-pilot" and FMS capabilities. Instead of relying on ground-based navigational aids, aircraft may operate along routes using waypoints. Waypoint locations are not dependent upon ground-based navigational aids; therefore, not limited to where a waypoint may be located. With less limits, routes between Point A and B can be shorter. More than 90 percent of U.S. scheduled air carriers are equipped for some level of FMS systems capable of navigating PBN RNAV procedures. Because RNAV and RNP capabilities are now readily available on aircraft, PBN can serve as the primary means aircraft use to navigate along a route in the NAS.

The following subsections describe the two types of PBN procedures, RNAV and RNP, in greater detail.

A.6.1 AREA NAVIGATION

Exhibit A-4 compares conventional and RNAV routes. Conventional procedures rely primarily on ground-based NAVAIDs. Routes based on ground-based NAVAIDs rely on the aircraft equipment directly communicating with the NAVAID radio signal, and they are often limited by issues such as line-of-sight and signal reception accuracy. NAVAIDs such as Very High Frequency (VHF) Omnidirectional Ranges (VORs) are affected by variable terrain and other obstructions that can limit their signal accuracy. RNAV enables aircraft traveling through terminal and enroute airspace to follow any desired flight route within the coverage of ground-based NAVAIDs or GPS-based navigational aids, rather than flying a point-to-point route over NAVAIDs following a conventional procedure. RNAV enables aircraft traveling through terminal and enroute airspace to follow more accurate and better-defined routes compared to conventional procedures. This results in more predictable routes and altitudes that can be preplanned by the pilot and ATC. Predictable routes improve the ability to ensure vertical, longitudinal, and lateral separation among aircraft.

Consequently, a route that is dependent upon ground-based NAVAIDs requires at least 6 NM of clearance on either side of its main path to ensure accurate signal reception. As demonstrated by the thin black lines on Exhibit 3-4, this clearance requirement increases the farther an aircraft is from the VOR. In comparison, RNAV signal accuracy requires only 2 NM of clearance on either side of a route's main path.

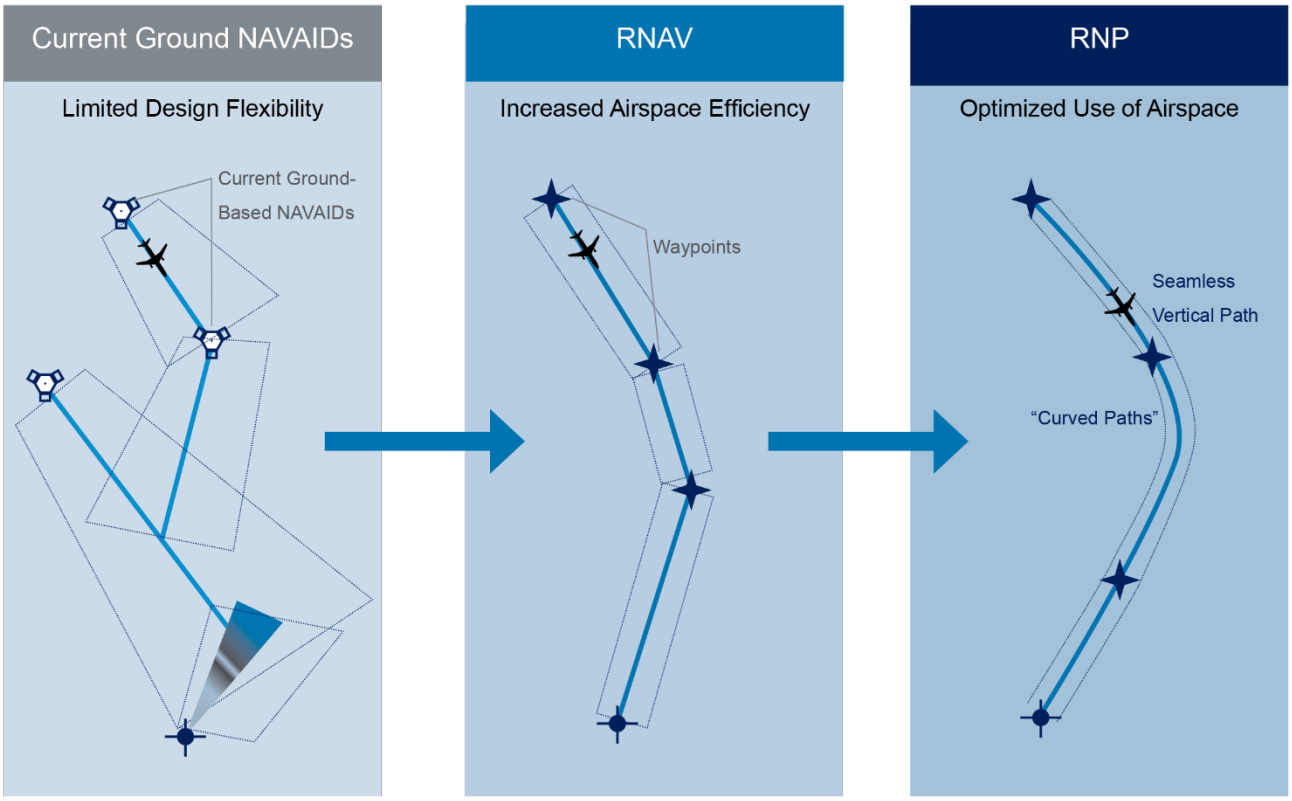
---

[40] U.S. Department of Transportation, Federal Aviation Administration, Modernization of U.S. Airspace, "What is NextGen?" May 7, 2018, https://www.faa.gov/nextgen/what_is_nextgen/ (accessed October 5, 2018).

[41] U.S. Department of Transportation, Federal Aviation Administration, Modernization of U.S. Airspace, "New Technology," August 31, 2018, https://www.faa.gov/nextgen/how_nextgen_works/new_technology/ (accessed October 5, 2018).

[42] Required Navigation Performance (RNP) is an RNAV procedure with signal accuracy that is increased through the use of onboard performance-monitoring and alerting systems. RNP enables the aircraft navigation system to monitor the navigation performance it achieves and to inform the pilots if the requirement is not met during an operation. An RNP value indicates how far an aircraft can be from a designed route. The lower the number, the closer an aircraft must be to the route to maintain compliance. An RNAV procedure that requires greater accuracy (less than 1 nautical mile on either side of a route) requires additional onboard performance-monitoring and alerting equipment, as well as special pilot training.

EXHIBIT A-4 COMPARISON OF ROUTES FOLLOWING CONVENTIONAL VERSUS RNAV AND RNP PROCEDURES



NOTES:
NAVAIDS – Navigational Aids
RNAV – Area Navigation
RNP – Required Navigation Performance
SOURCE: U.S. Department of Transportation, Federal Aviation Administration, June 2016.

A.6.2 REQUIRED NAVIGATION PERFORMANCE

RNP is an RNAV procedure with signal accuracy that is increased using onboard performance monitoring and alerting systems. An RNP is an RNAV procedure that requires greater accuracy of onboard performance-monitoring and alerting equipment, as well as special pilot training. A defining characteristic of an RNP operation is the ability for an RNP-capable aircraft navigation system to monitor the accuracy of its navigation (based on the number of GPS satellite signals available to pinpoint the aircraft location) and to inform the crew if the required data becomes unavailable.

Exhibit A-4 compares conventional, RNAV, and RNP procedures. It shows how an RNP-capable aircraft navigation system provides a more accurate location (down to less than a mile from the intended path) and will follow a highly predictable path. The enhanced accuracy and predictability make it possible to implement procedures within controlled airspace that are not always possible under the current air traffic system.

APPENDIX B

Airport Noise Advisory, Technical and Citizen Advisory Committees Presentations and Responses to Input

APPENDIX B AIRPORT NOISE ADVISORY, TECHNICAL AND CITIZEN ADVISORY COMMITTEES PRESENTATIONS AND RESPONSES TO INPUT

B.1 PRESENTATIONS

The following are the presentation material discussed at each Technical Advisory Committee (TAC) and Citizen Advisory Committee (CAC) meeting. This appendix also includes the presentation to the Airport Noise Advisory Committee (ANAC) on June 19, 2019. The presentation included an overview of the results and recommended actions for consideration by ANAC. All presentation material was posted to the San Diego County Regional Airport Authority's (the Authority) website (https://www.san.org/Airport-Noise/FAR-Part-150?EntryId=12485) after each meeting.

B.1.1 CAC MEETING #1 – MARCH 22, 2018

SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

Welcome

Citizen Advisory Committee Meeting #1

March 22, 2018

Agenda

- Introductions
- Citizen Advisory Committee (CAC)
- Study Overview:
  - Part 150 Study Update
  - Flight Procedure Evaluation
- Anticipated Meeting Schedule
- Identification of 2 CAC Members for Technical Advisory Committee (TAC)
- Questions
- Next Meeting

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Introductions

San Diego County Regional Airport Authority (Airport Authority)

- Owns and operates the airport
- Main Contact: Ms. Sjohnna Knack, Program Manager

14 CFR Part 150 Consultant Team – In Procurement Process

- Part 150 focus:
  - Areas exposed to CNEL levels at or higher than 65 dBA
  - FAA will only fund abatement/mitigation at or higher than CNEL 65 dBA
- Several flight procedure recommendations to reduce noise outside CNEL 65 dBA
- SDCRAA to conduct flight procedure evaluation outside the 150 Study process

SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

Introductions (continued)

Flight Procedure Analysis Consultant Team

- Project Lead: Mr. Stephen Smith
- Ricondo & Associates, Inc.
- Mead & Hunt

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.


Citizen Advisory Committee
• Formation
• Role
• Responsibilities
• Conduct and Logistics
5

Citizen Advisory Committee (CAC)

- Formation of Citizen Advisory Committee (CAC)
  - Purpose: Advise on the Part 150 Noise Compatibility Study
  - Interested residents applied for participation
- High level of interest: 40+ applications for 15 CAC seats
- Applicants selected to allow for fair representation of communities

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

CAC's Advisory Role - Flight Procedure Evaluation

- Provide input to the Technical Advisory Committee (TAC).
  - ANAC recommendations
  - New noise considerations
- Provide two members to serve on TAC to represent CAC input.
- Represent your community.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

CAC Member Responsibilities

- Attend every meeting.
- Come to meeting with an open mind.
- Represent your community in a professional and respectful manner.
- Respect other committee members views and opinions.
- Ask questions as a means to reach a better understanding on a topic.
- Provide meaningful input.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

CAC Meeting Conduct and Logistics

- Operated on a consensus basis.
- Conducted in a professional and respectful manner.
- Facilitated by an experienced meeting facilitator.
  - Stay on agenda
  - Be sensitive to meeting time
  - Let every committee member share their thoughts
- CAC meetings will be open to the public to observe.
- Statements to the press can only represent the individual not the committee.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Flight Procedure Evaluation

- Purpose
- ANAC Sub-Committee Recommendations
- Process
- Important Factors

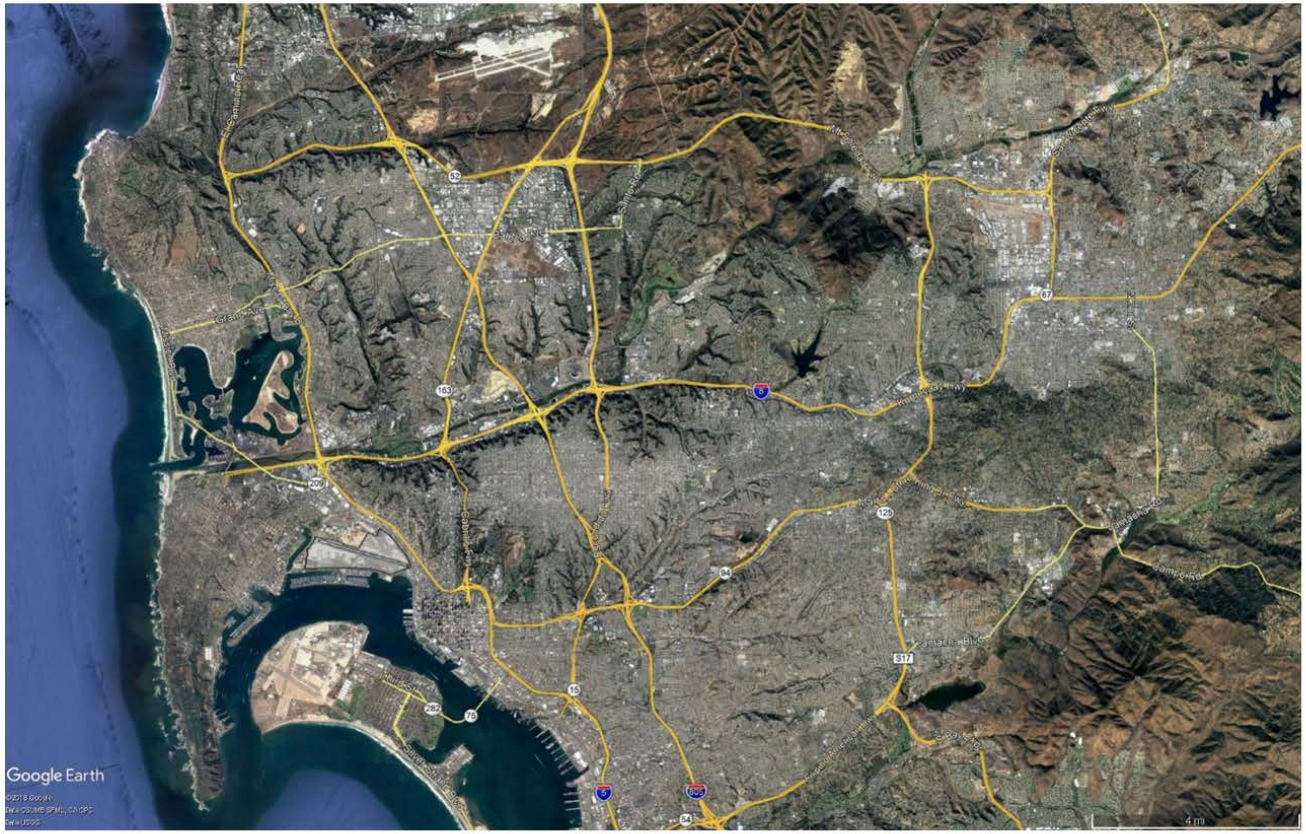
Flight Procedure Evaluation

- The Airport Noise Advisory Committee (ANAC), through the Subcommittee, proposed multiple flight procedure recommendations to reduce aircraft noise.
- In Dec 2017, Airport Authority Board accepted the Action Plan to assess ANAC recommendations.
- Flight Procedure Evaluation Purpose:
  - Evaluate flight procedures affecting areas outside 65 CNEL.
  - Gather community input on these procedures.

FAA has ultimate control over implementing flight procedure changes

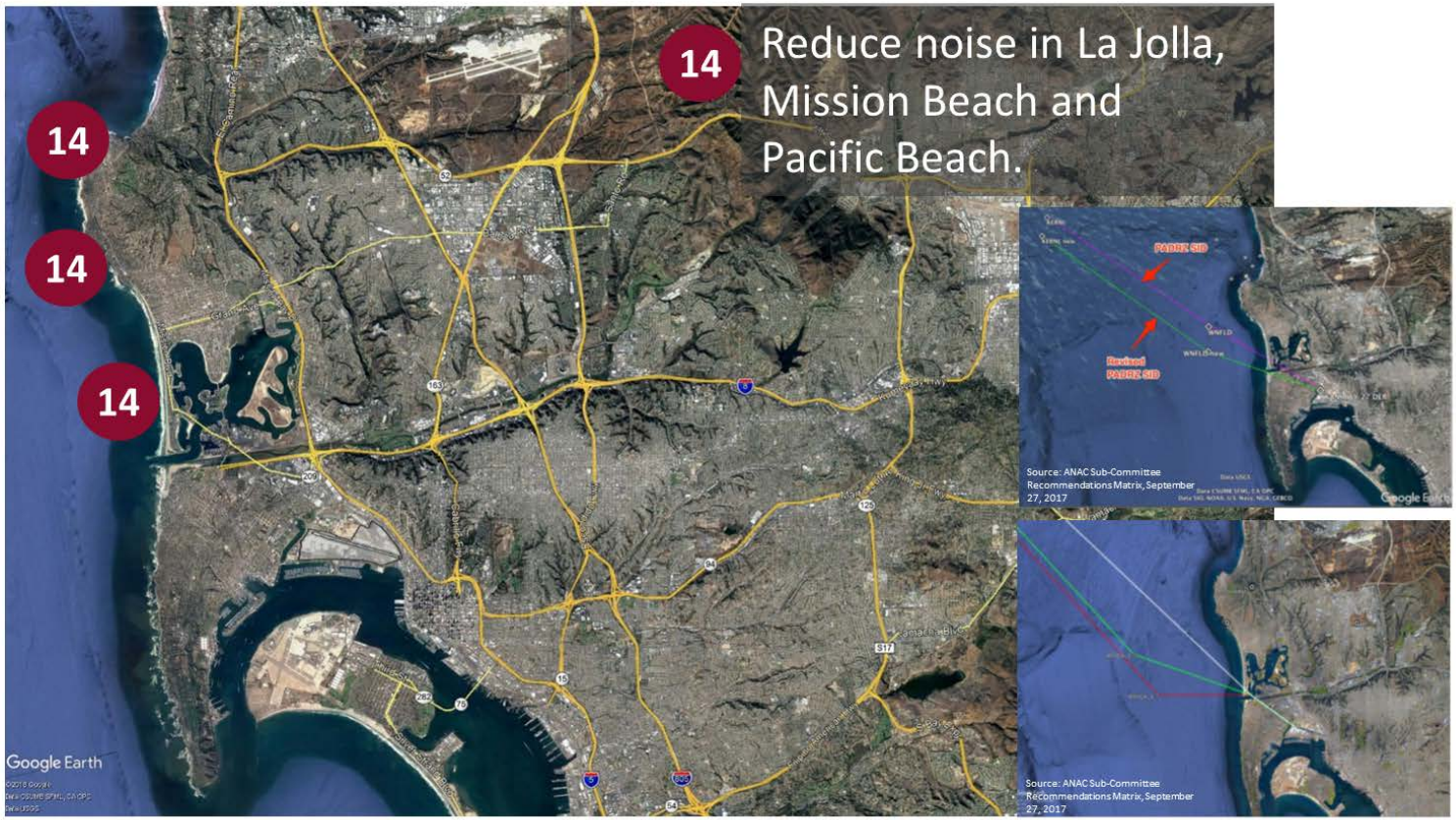
SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

ANAC Recommendations - Flight Procedures



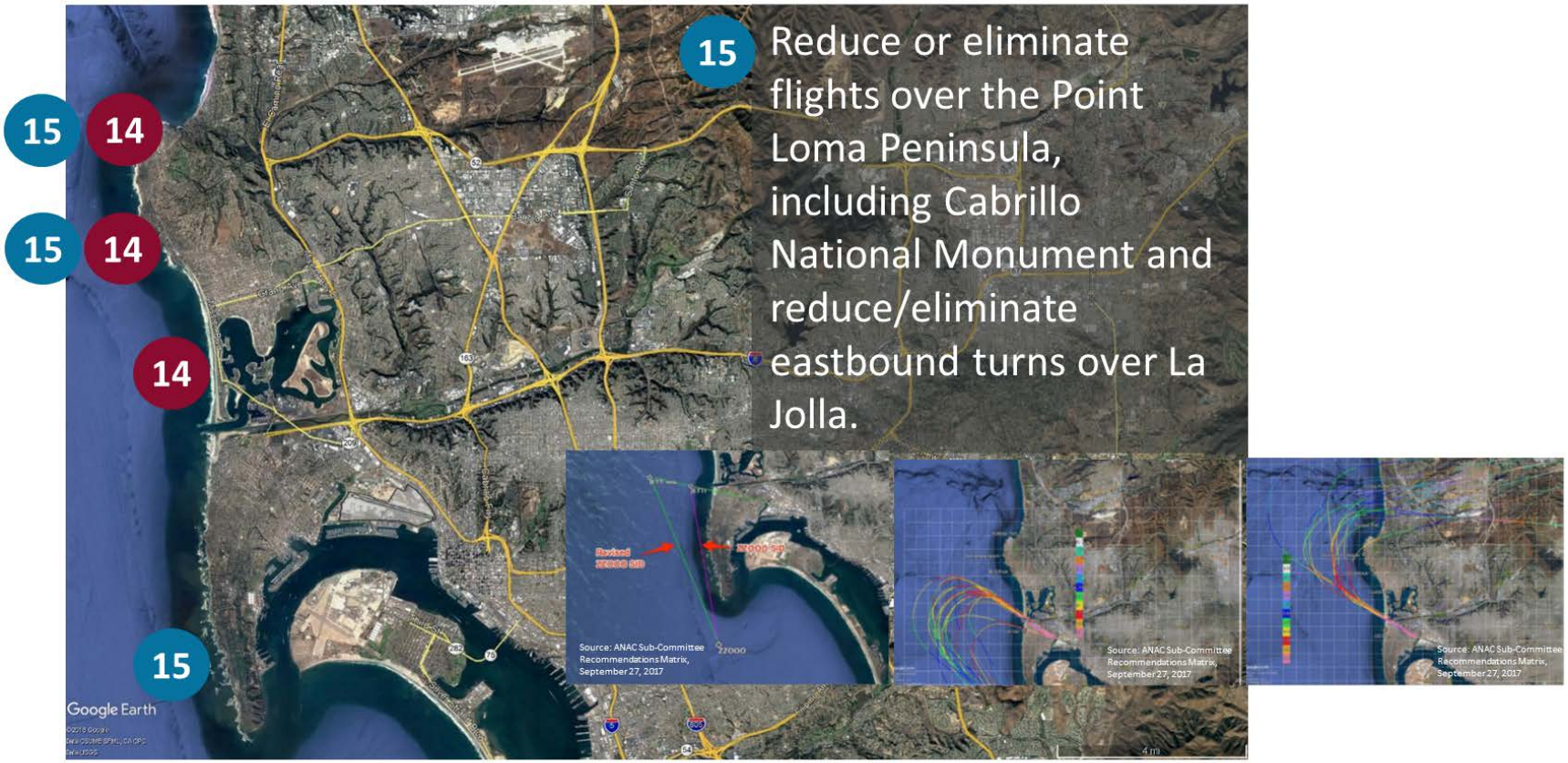
SAN DIEGO INTERNATIONAL AIRPORT.
LET'S GO.

ANAC Recommendations - Flight Procedures



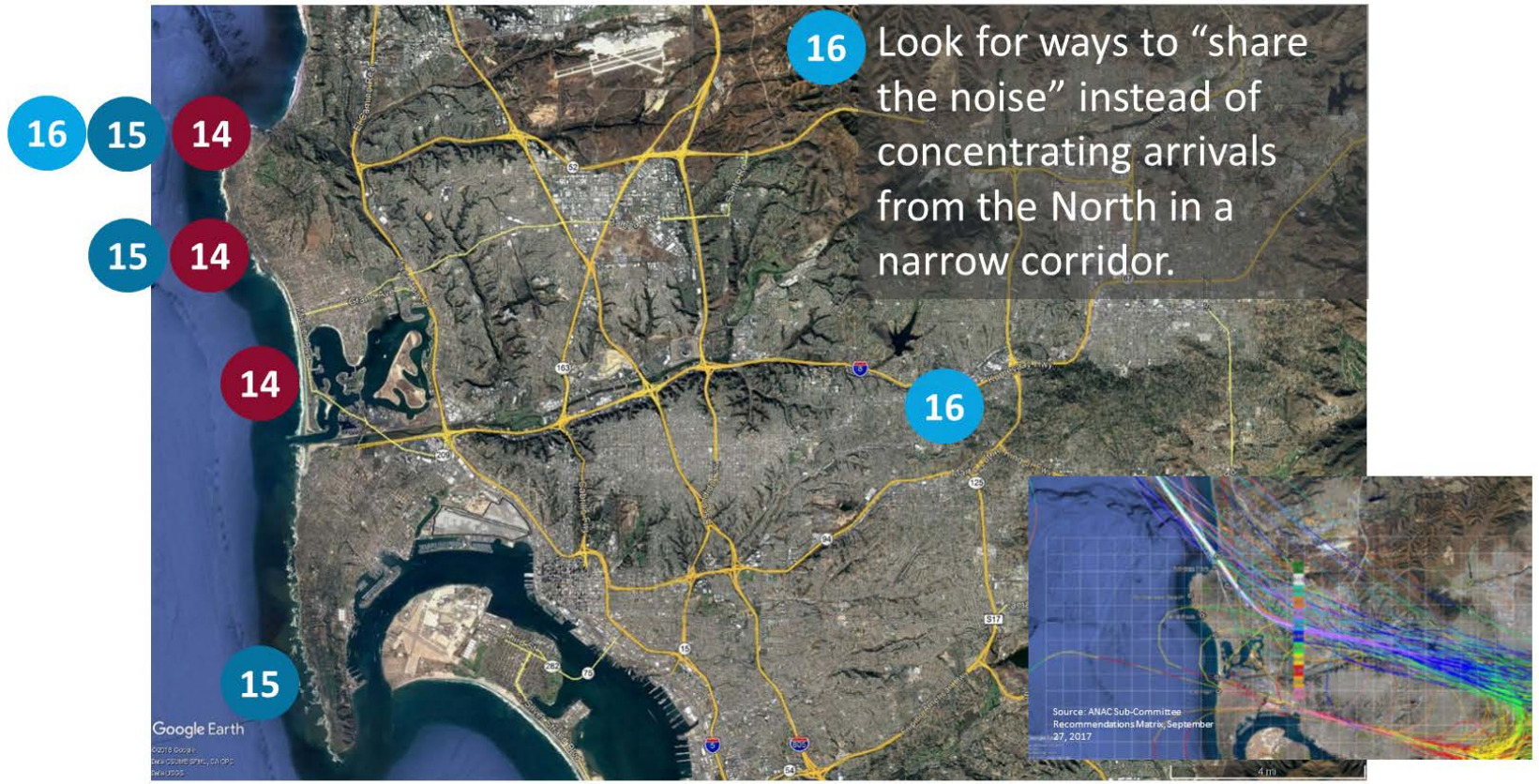
SAN DIEGO INTERNATIONAL AIRPORT.
LET'S GO.

ANAC Recommendations - Flight Procedures



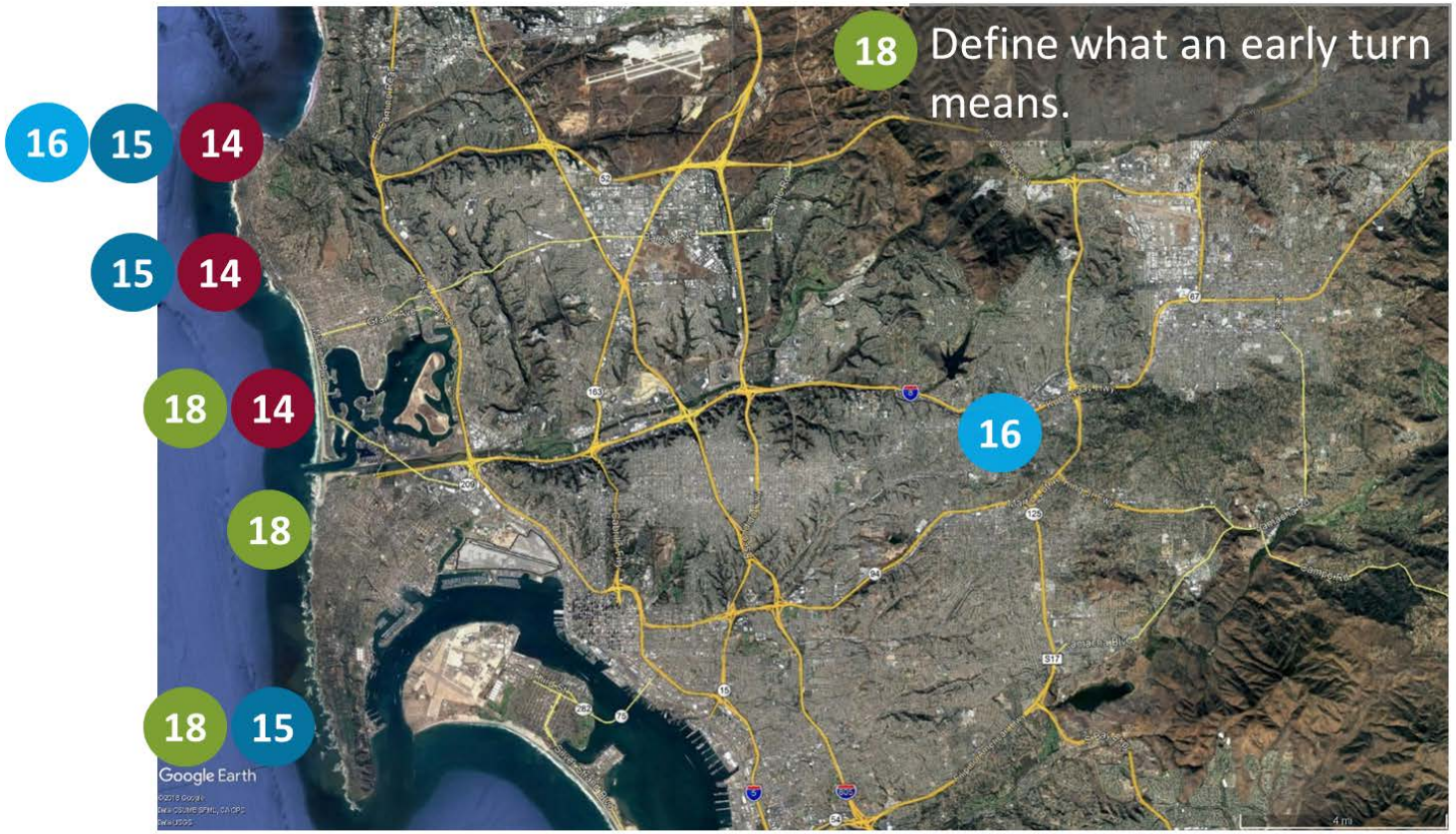
SAN DIEGO INTERNATIONAL AIRPORT.
LET'S GO.

ANAC Recommendations - Flight Procedures



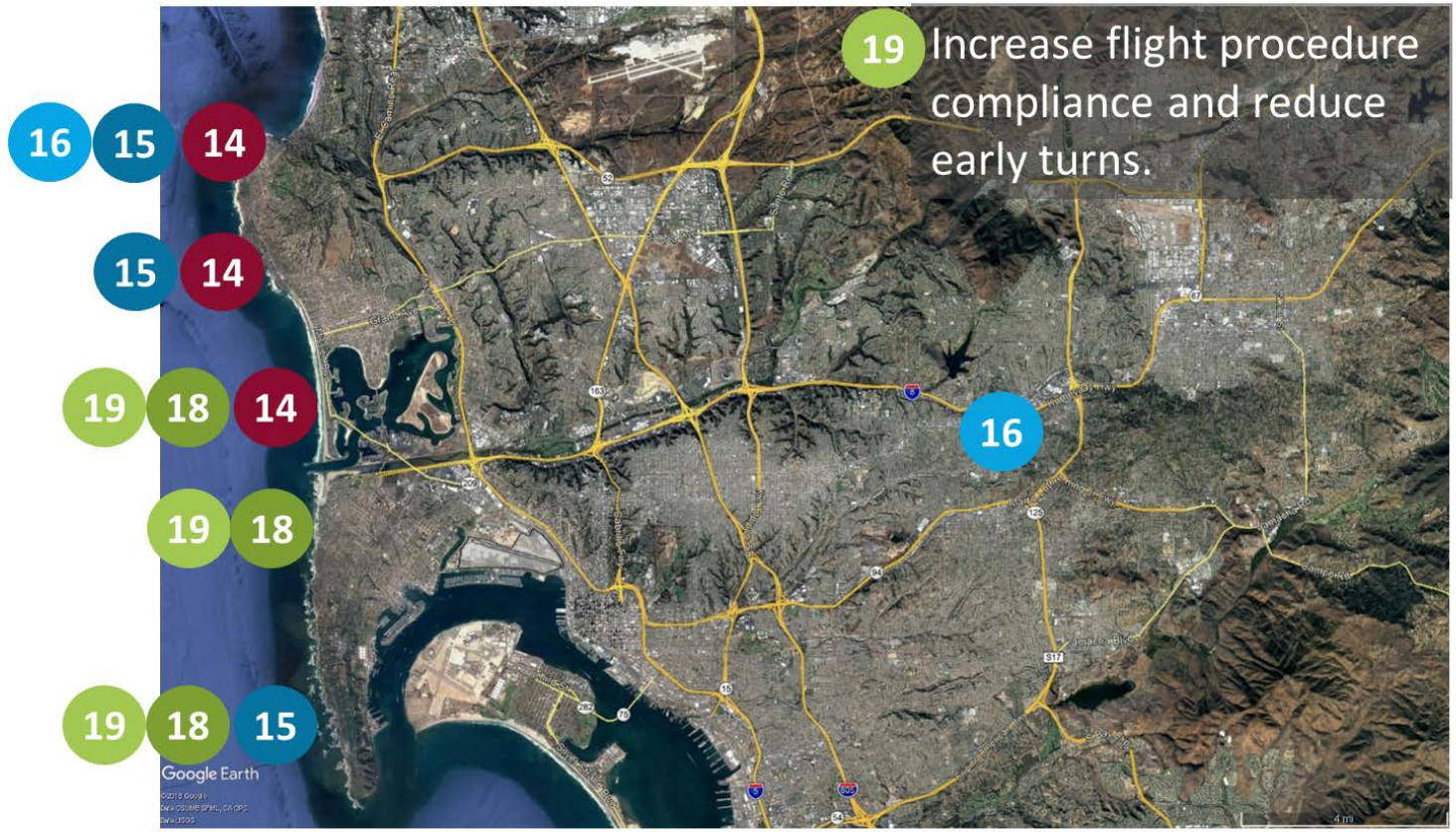
SAN DIEGO INTERNATIONAL AIRPORT.
LET'S GO.

ANAC Recommendations - Flight Procedures



SAN DIEGO INTERNATIONAL AIRPORT.
LET'S GO.

ANAC Recommendations - Flight Procedures



SAN DIEGO INTERNATIONAL AIRPORT.
LET'S GO.

ANAC Recommendations - Flight Procedures

SAN DIEGO INTERNATIONAL AIRPORT.
LET'S GO.

Conceptual Flight Procedure Analysis Processes

Requirements

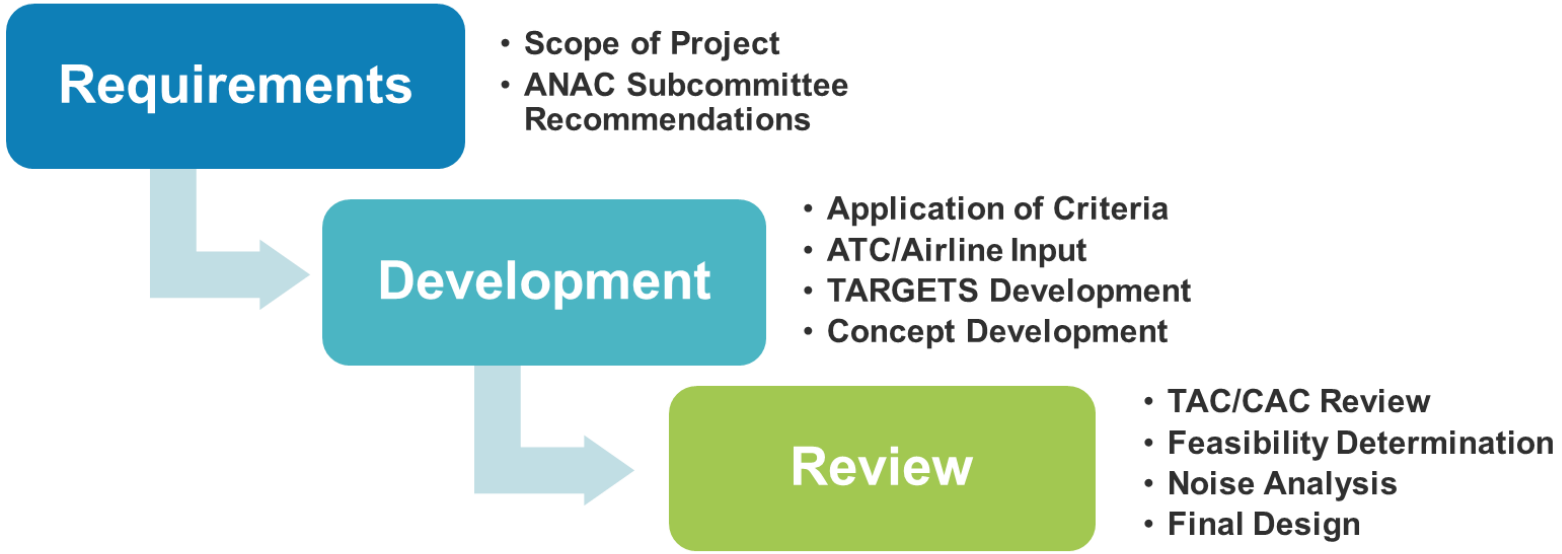
- **Scope of Project**
- **ANAC Subcommittee Recommendations**

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Conceptual Flight Procedure Analysis Processes

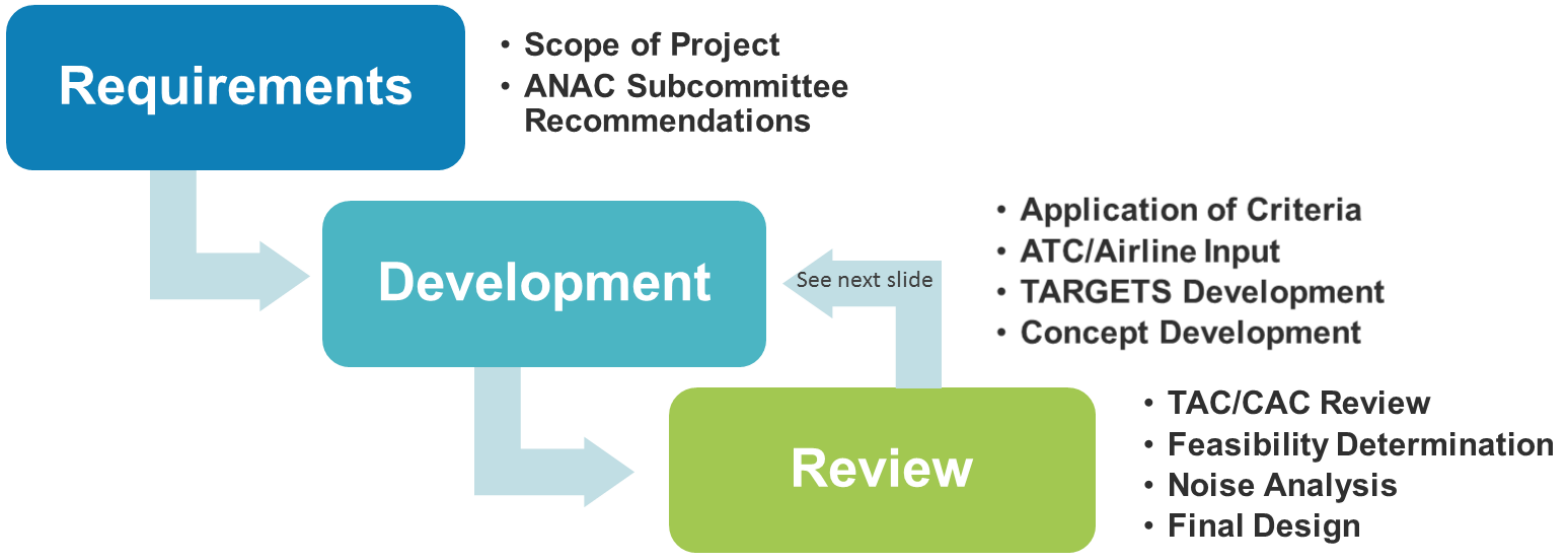
SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Conceptual Flight Procedure Analysis Processes



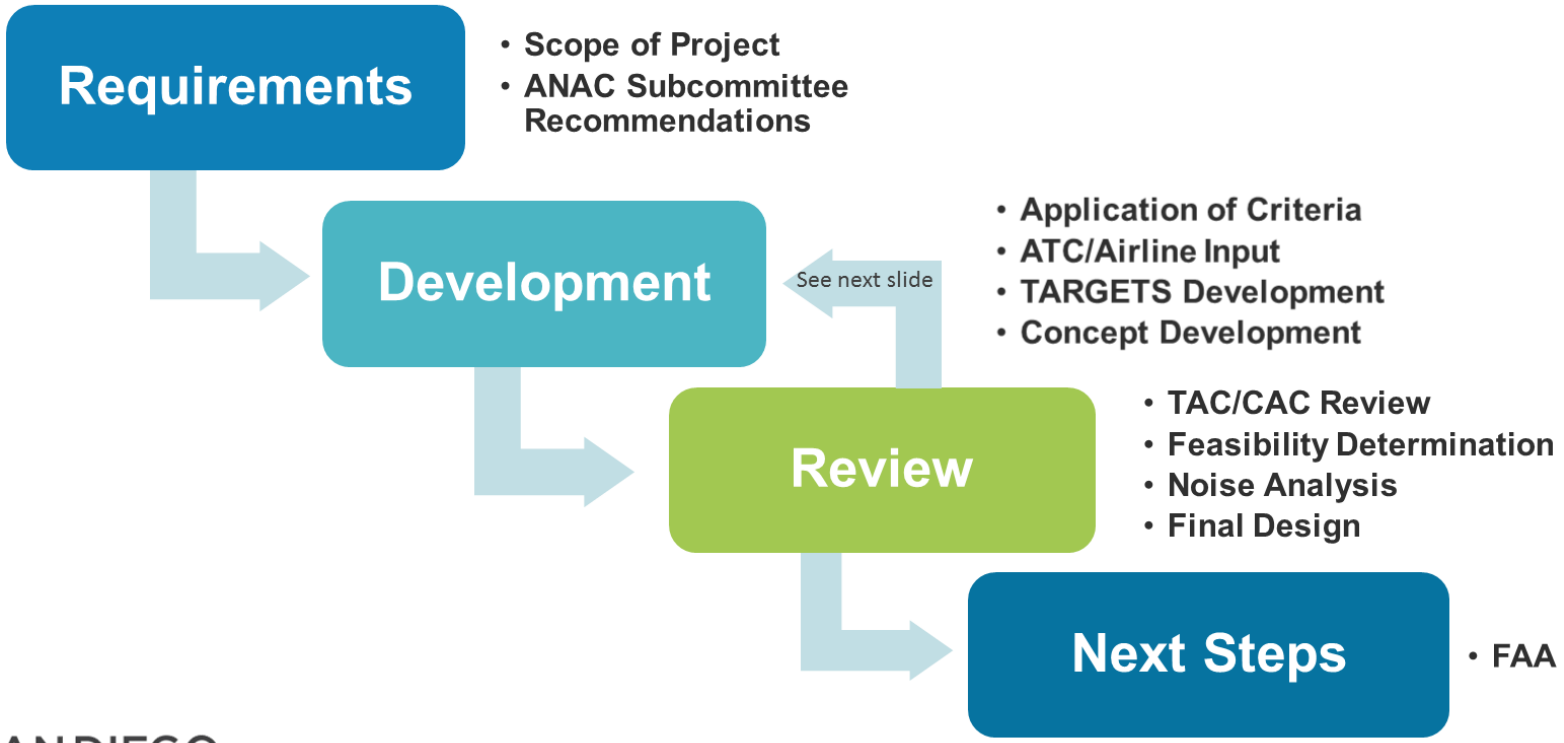
SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Conceptual Flight Procedure Analysis Processes



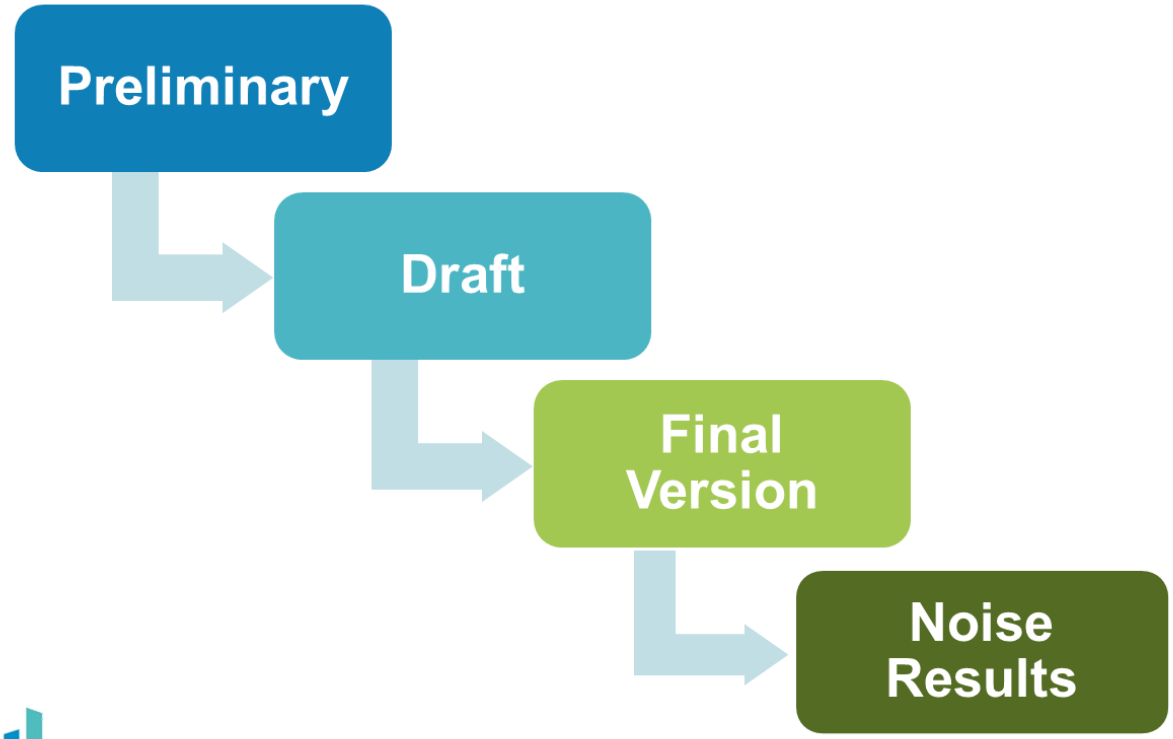
SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Conceptual Flight Procedure Analysis Processes



SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

Development/Review Steps



Preliminary

Design concept procedures within parameters that meet intent of ANAC recommendations. If a design is not possible to address a recommendation, reasons will be documented.

Draft

Consider input from TAC on Version 1 designs and adjust where possible. Reasons for input that cannot be accommodated will be documented.

Final

Consider input from CAC/TAC on Version 2 designs and adjust where possible. Reasons for input that cannot be accommodated will be documented.

Noise Results

Calculate noise on Final Version designs and compare with Baseline levels to determine potential change. Review final designs and noise changes with CAC and TAC.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

7100.41 Phase 1 - Preliminary Activities

A Process to Evaluate Safety, Risk, Benefit, Feasibility, Readiness, and Performance

Initial Coordination

- Does the Proposal Meet FAA Goals and Objectives? If Yes, Baseline Analysis. If No, STOP

Baseline Analysis

- Analysis of Baseline Data and Benefits
- Does the Proposal Meet FAA Goals and Objectives? If Yes, Go to Development Phase. If No, Re-evaluate Baseline Analysis or STOP

Approval

- If Accepted go to Development Phase. If Not Accepted Back to Baseline Analysis or STOP

SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

Process - Concept Design

Design Parameters

- Do not change aircraft flight paths at or below 3,000 feet above SDIA's elevation
- Do not impact safety
- Meet FAA design criteria
- Fit within existing airspace and maintain existing airspace hand-off areas
- Do not impact capacity of SDIA
- Do not move noise to new non-compatible areas

Operations Data and Design Tool

- Evaluate post-Metroplex operations
- Use FAA's Terminal Area Route Generation, Evaluation and Traffic Simulation (TARGETS) design tool to design concept procedures.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Process - Aircraft Noise Analysis

Methodology: Use Aviation Environmental Design Tool (AEDT)

- Use FAA ATO methodology to assess potential impacts
- Calculate noise levels for closely-spaced grid points
- Analyze difference between alternative and baseline

Flight Track and Operation Patterns

- Develop AEDT flight tracks and altitude profiles for traffic flows based on best radar and flight operations data

Noise Model Outputs

- Calculate Community Noise Equivalent Noise Level (CNEL)
- Calculate change in CNEL between an alternative and the baseline.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Important Factors

Will:

- Propose designs compatible with existing air traffic environment
- Gather critical input from CAC and TAC during design process
- Coordinate with FAA ATO staff during concept design process
- Develop required information for FAA consideration the “Preliminary Activities” phase of the FAA Order 7100.41a process, if necessary
- Calculate change in noise levels for specific procedures

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Important Factors

Will not:

- Evaluate recommendations to reduce noise at or higher than CNEL 65 dBA – reserved for Part 150 Study
- Propose designs that require FAA waivers
- Propose designs that will negatively impact SDIA capacity
- Conduct all steps in FAA Order 7100.41A
- Evaluate non-SDIA traffic overflights
- Evaluate “restriction” type proposals that require 14 CFR Part 161 study

SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

Process - Stakeholder Input

Review

- Citizen Advisory Committee (CAC)
  - Input on ANAC recommendations and related goals
  - At least two meetings to review draft/final concepts
  - One meeting to review conclusions
- Technical Advisory Committee (TAC)
  - Broader stakeholder group: Airline(s), commuter carrier(s), corporate operator(s) and FAA ATO.
  - Input to confirm procedures are operationally viable and identify potential issues
  - At least three meetings to review iterative/draft/final concepts
  - One meeting to review conclusions

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Anticipated Meeting Schedule

CAC Flight Procedure Analysis Meeting Timeline

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.


Select 2 CAC Members for
Technical Advisory Committee

CAC Q&A and Comments
Next Meeting

B.1.2 TAC MEETING #1 – APRIL 5, 2018

SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

Welcome

Technical Advisory Committee Meeting #1

April 5, 2018

Agenda

- Introductions
- Technical Advisory Committee (TAC)
- Study Overview:
  - Part 150 Study
  - Flight Procedure Evaluation
- Anticipated Meeting Schedule
- Questions
- Next Meeting

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Introductions

- **San Diego County Regional Airport Authority (SCRAA)**
  - Owns and operates the airport
  - Main Contact: Ms. Sjohnna Knack, Program Manager
- **14 CFR Part 150 Consultant Team** – In Procurement Process
  - Part 150 focus:
    - Areas exposed to CNEL levels at or higher than 65 dBA
    - FAA will only fund abatement/mitigation at or higher than CNEL 65 dBA
  - Several flight procedure recommendations to reduce noise outside CNEL 65 dBA
  - SDCRAA to conduct flight procedure evaluation outside the 150 Study process

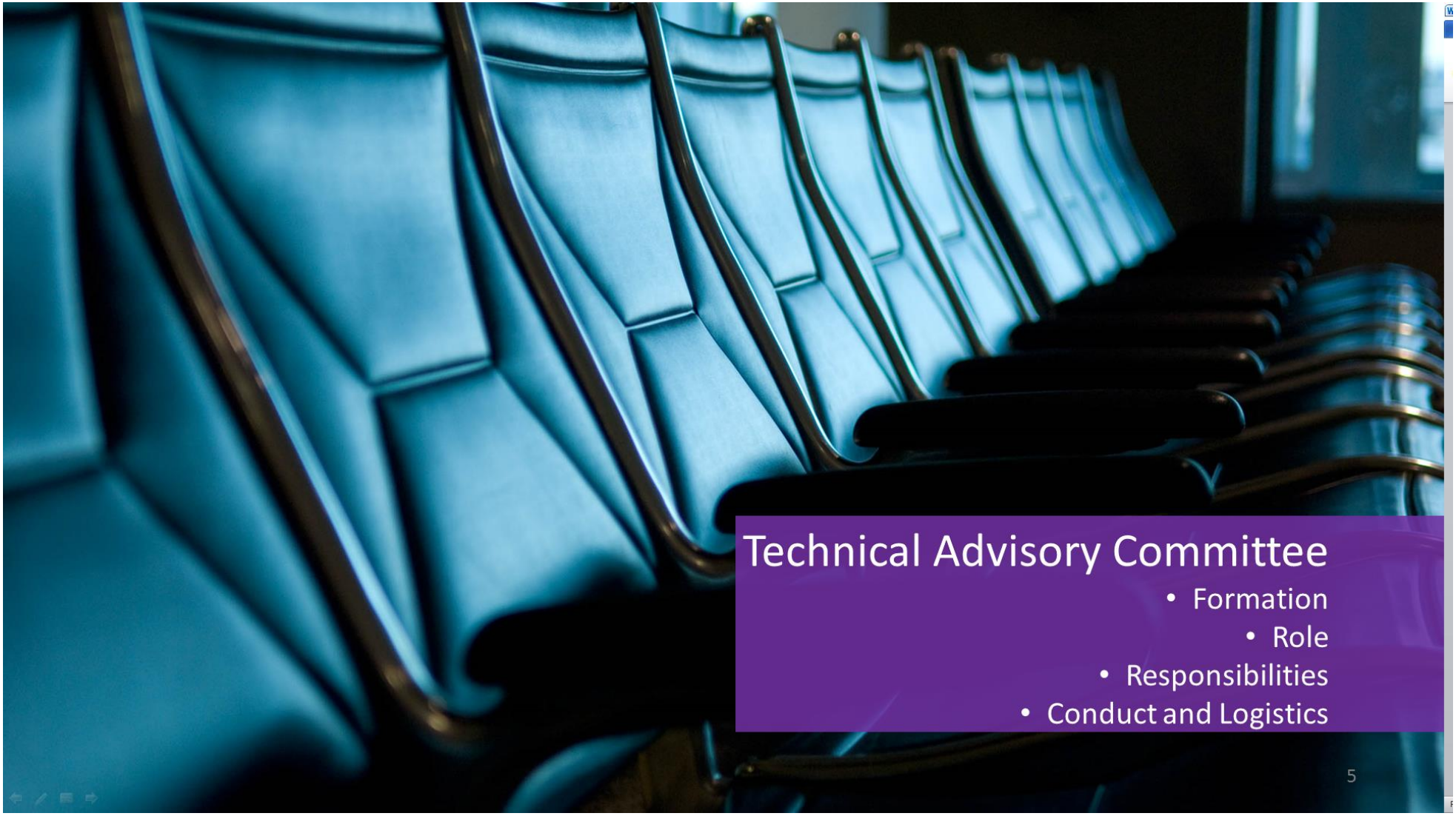
SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

Introductions (cont.)

Flight Procedure Evaluation Consultant Team

- Ricondo & Associates, Inc.
- Mead & Hunt
- Project Lead: Mr. Stephen Smith

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.


Technical Advisory Committee
• Formation
• Role
• Responsibilities
• Conduct and Logistics
5

Technical Advisory Committee (TAC)

- Purpose: Provide input on technical process and policy/regulation for the Part 150 Noise Compatibility Study and the Flight Procedures Evaluation Study
- Represents San Diego International Airport (SAN) stakeholder groups
  - Federal Aviation Administration (FAA) Airports and Air Traffic Organization (ATO)
  - Users: Airline, Commuter and Corporate General Aviation
  - SDCRAA Airport (various departments)
  - Local government jurisdictions
  - Community representatives around SAN: Airport Noise Advisory Committee (ANAC) and Citizen Advisory Committee (CAC)

SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

TAC's Advisory Role - Flight Procedure Evaluation

- Provide technical input to Airport Authority and consultant
- Input on concept procedure designs
  - Safety feedback
  - Operational feedback
  - Benefit/cost feedback
- Represent your stakeholder group.

SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

TAC Member Responsibilities

- Attend every meeting.
- Come to meeting with open-mind.
- Conduct discussions in a professional and respectful manner.
- Respect other committee members views and opinions.
- Ask questions as a means to reach a better understanding on a topic.
- Provide meaningful input.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

TAC Meeting Conduct and Logistics

- Operated on a consensus basis.
- Conducted in a professional and respectful manner.
- Facilitated by an experienced meeting facilitator.
  - Stay on agenda
  - Be sensitive to meeting time
  - Let every committee member share their thoughts
- TAC meetings will be open to the public to observe.
- Statements to the press can only represent the individual not the committee.

SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.


Flight Procedure Evaluation
• Purpose
• ANAC Sub-Committee Recommendations
• Process
• Important Factors
10

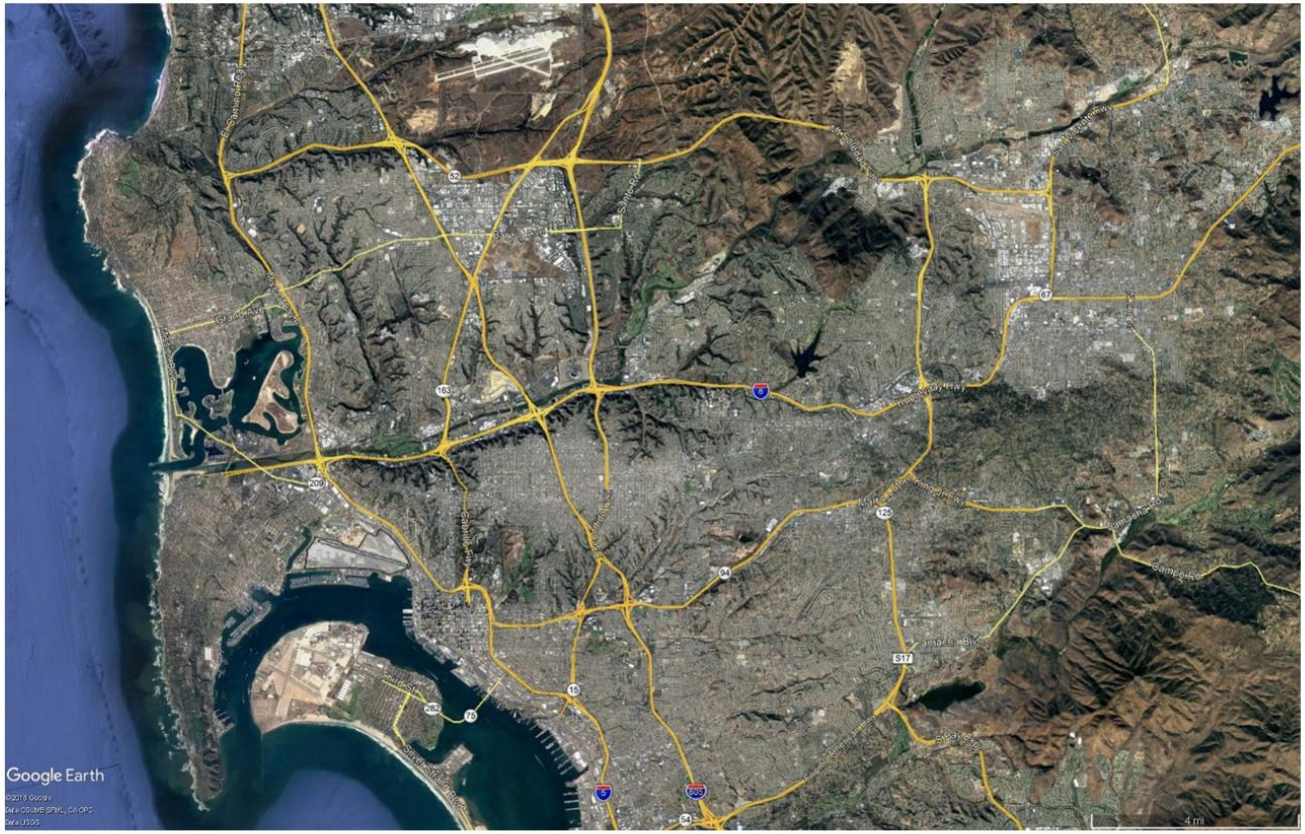
Flight Procedure Evaluation

- The Airport Noise Advisory Committee (ANAC) proposed multiple flight procedure recommendations to reduce aircraft noise.
- In Dec 2017, Airport Authority Board accepted the Action Plan to assess ANAC recommendations.
- Flight Procedure Evaluation Purpose:
  - Evaluate flight procedures affecting areas outside 65 CNEL.
  - Flight procedures closer to the airport will be evaluated in the Part 150 study.
  - Gather community input on these procedures.

FAA has ultimate control over implementing flight procedure changes

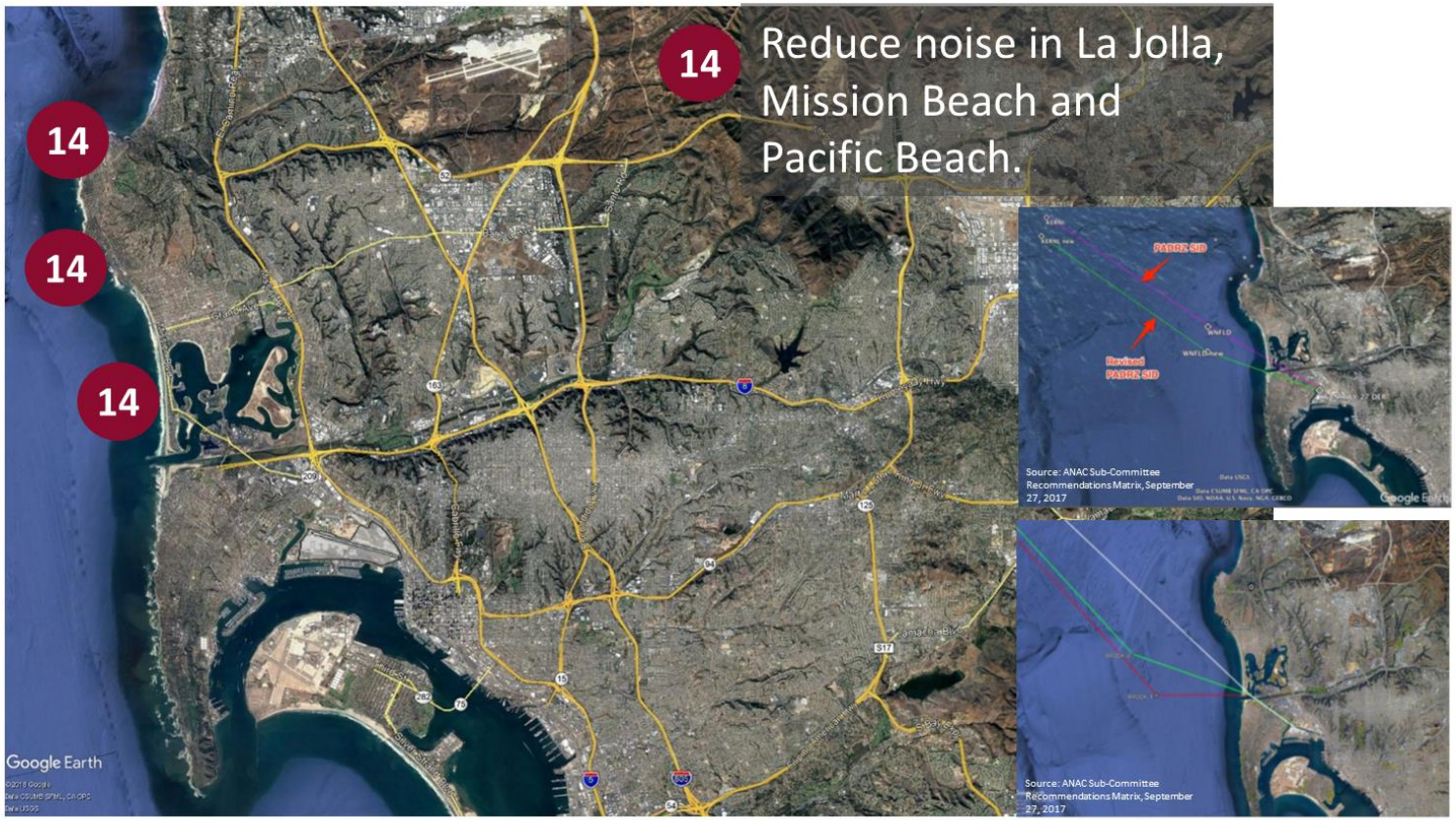
SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

ANAC Recommendations - Flight Procedures



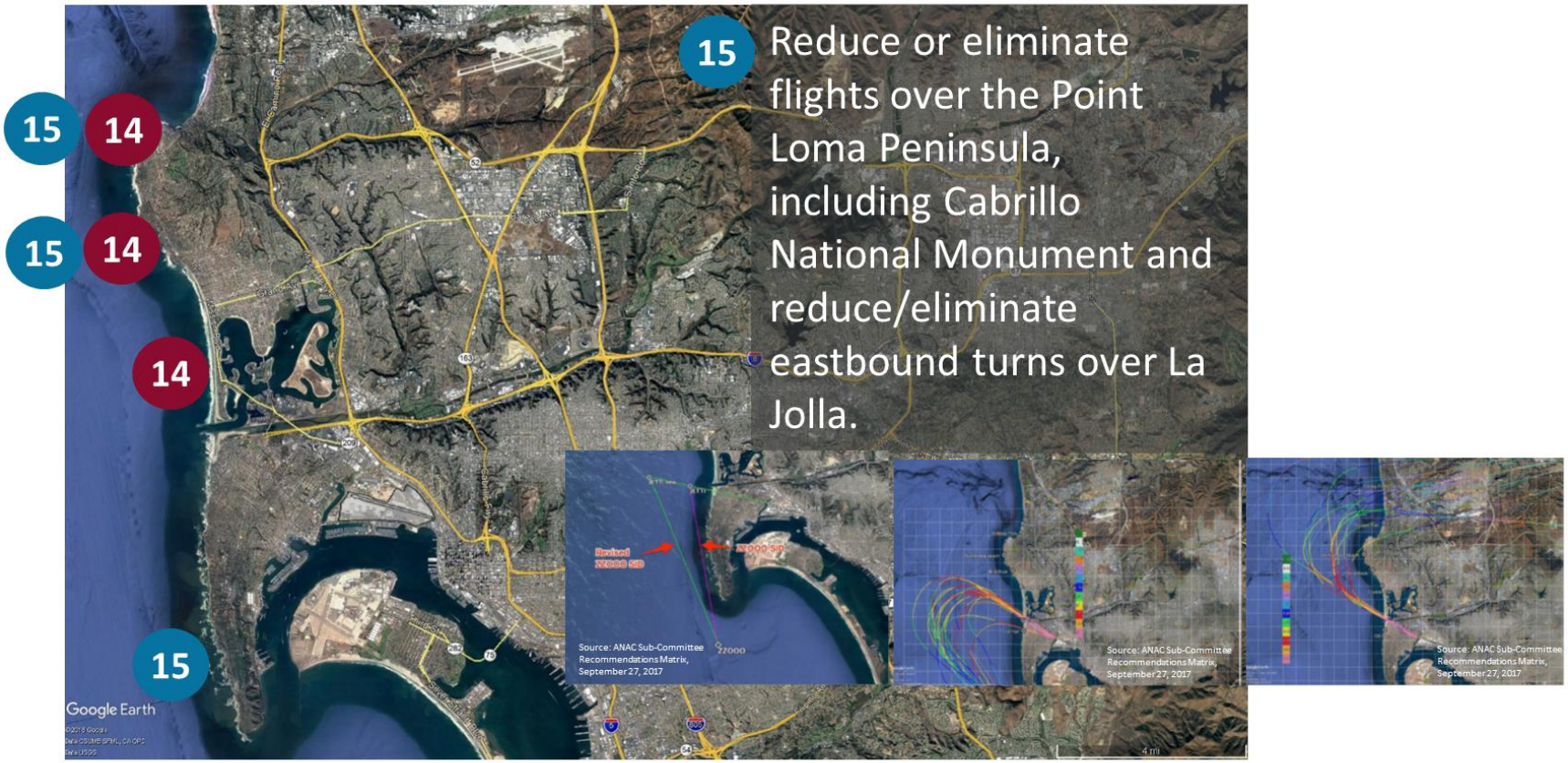
SAN DIEGO INTERNATIONAL AIRPORT.
LET'S GO.

ANAC Recommendations - Flight Procedures



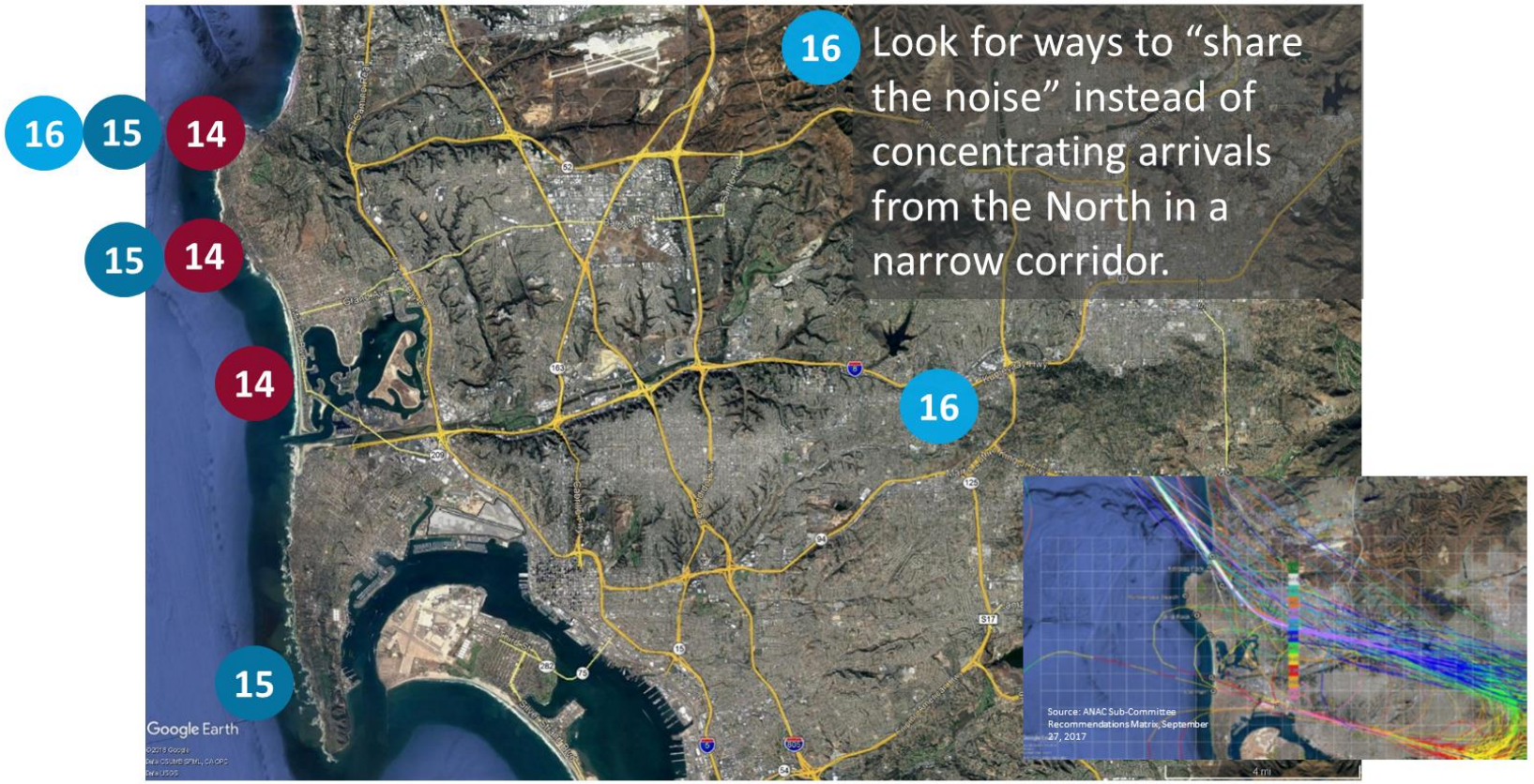
SAN DIEGO INTERNATIONAL AIRPORT.
LET'S GO.

ANAC Recommendations - Flight Procedures



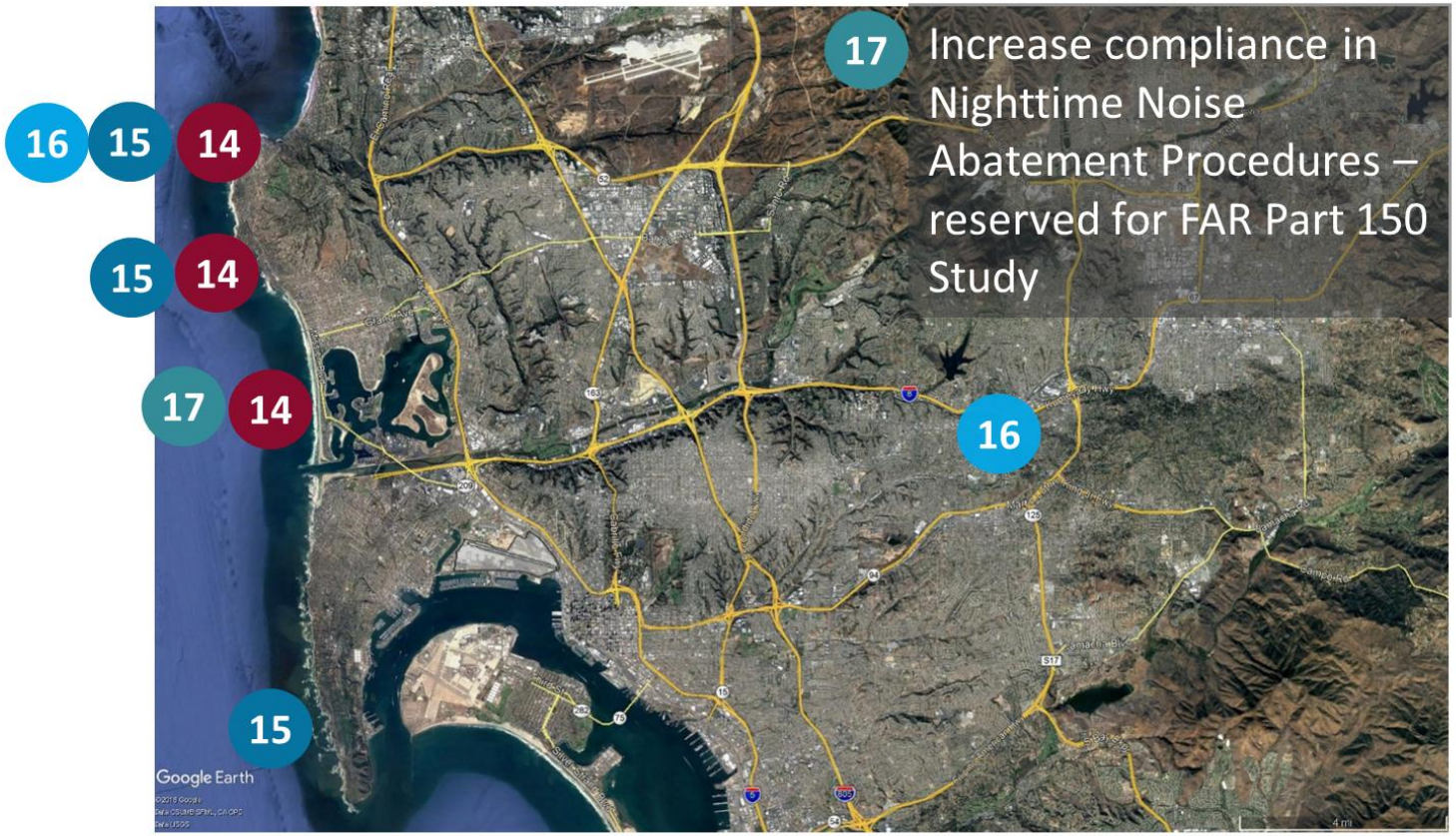
SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

ANAC Recommendations - Flight Procedures



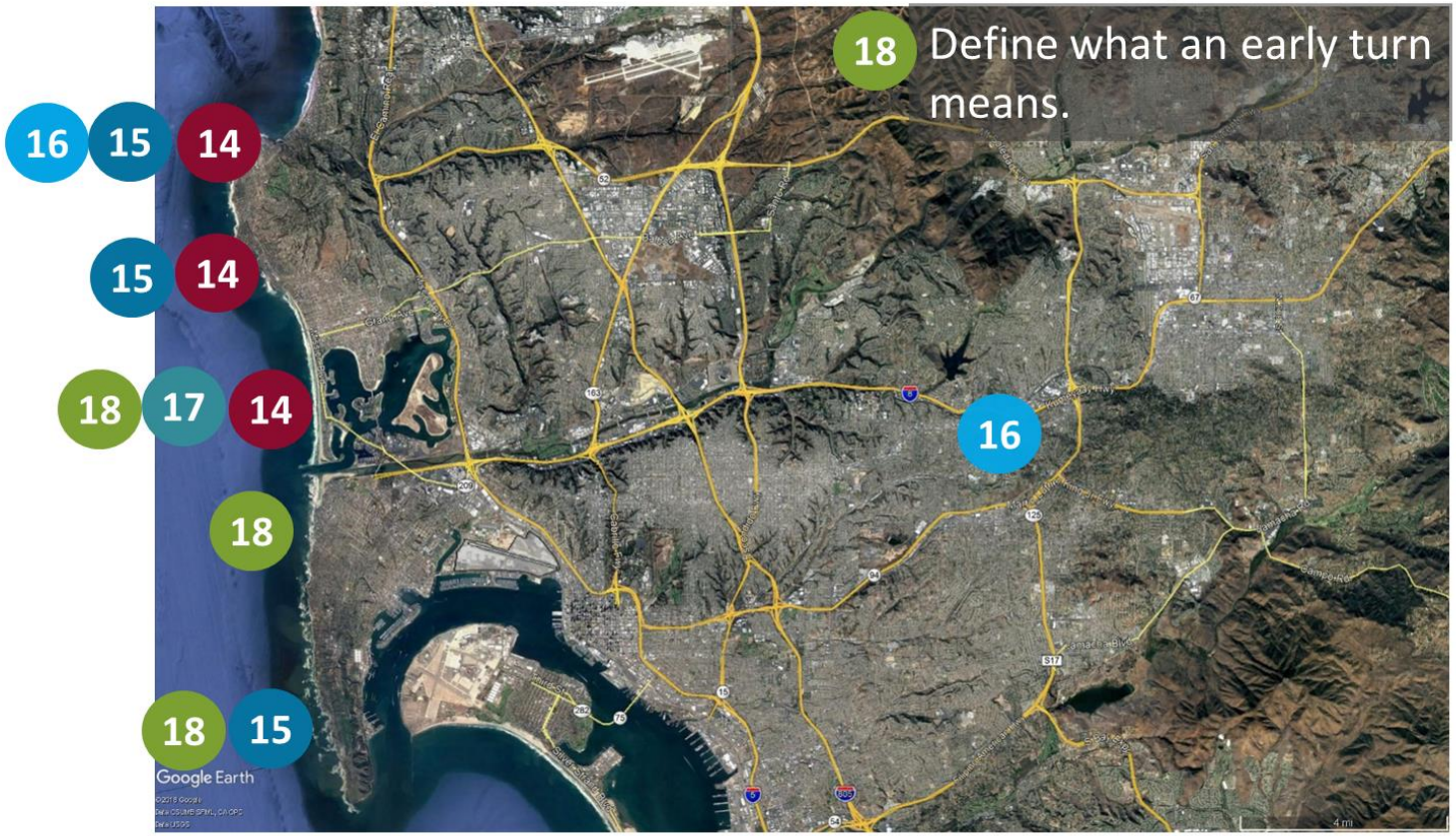
SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

ANAC Recommendations - Flight Procedures



SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

ANAC Recommendations - Flight Procedures

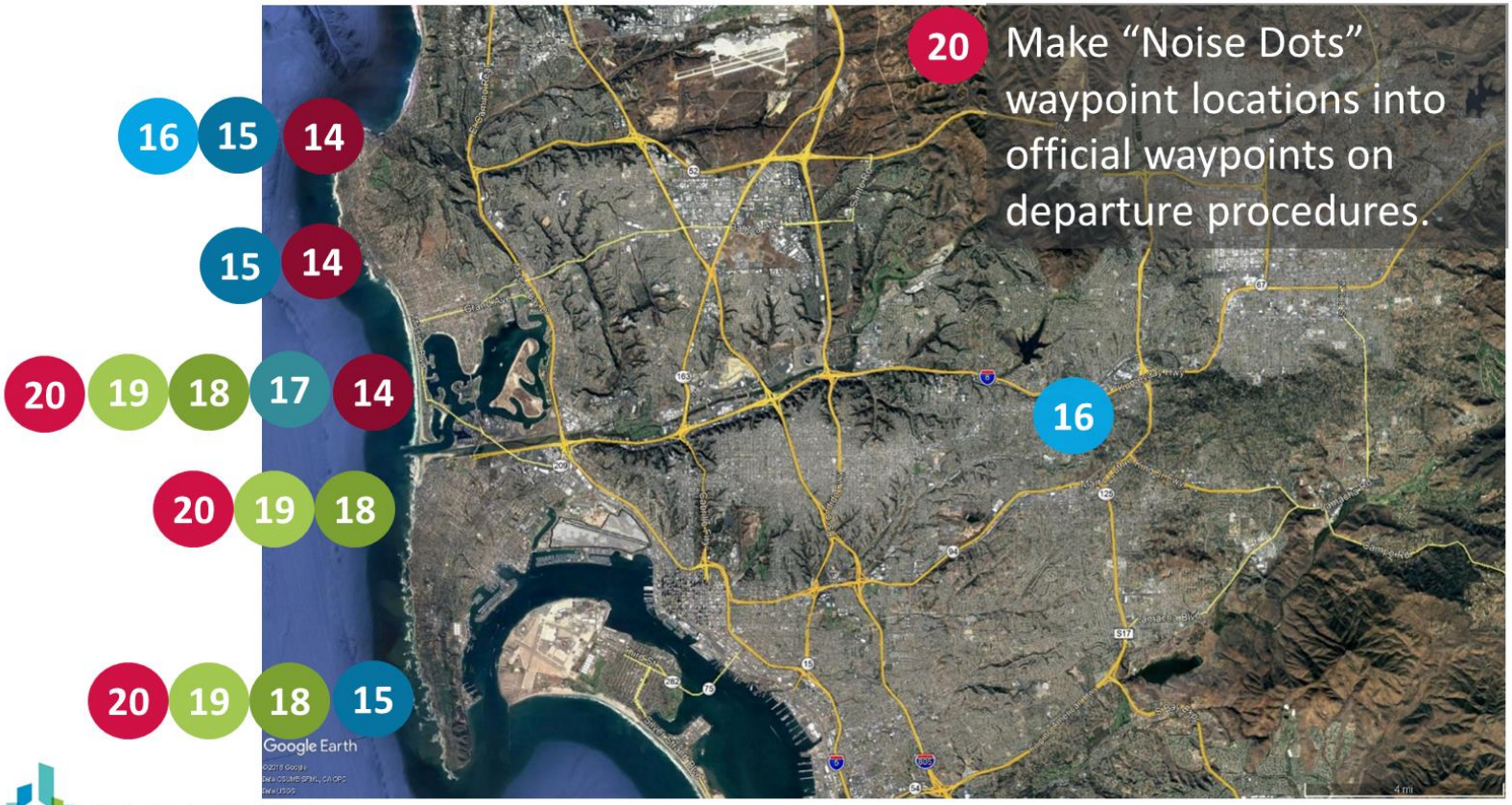


SAN DIEGO INTERNATIONAL AIRPORT.
LET'S GO.

ANAC Recommendations - Flight Procedures

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

ANAC Recommendations - Flight Procedures



SAN DIEGO INTERNATIONAL AIRPORT.
LET'S GO.

SDIA Conceptual Flight Procedure Analysis Processes

Requirements

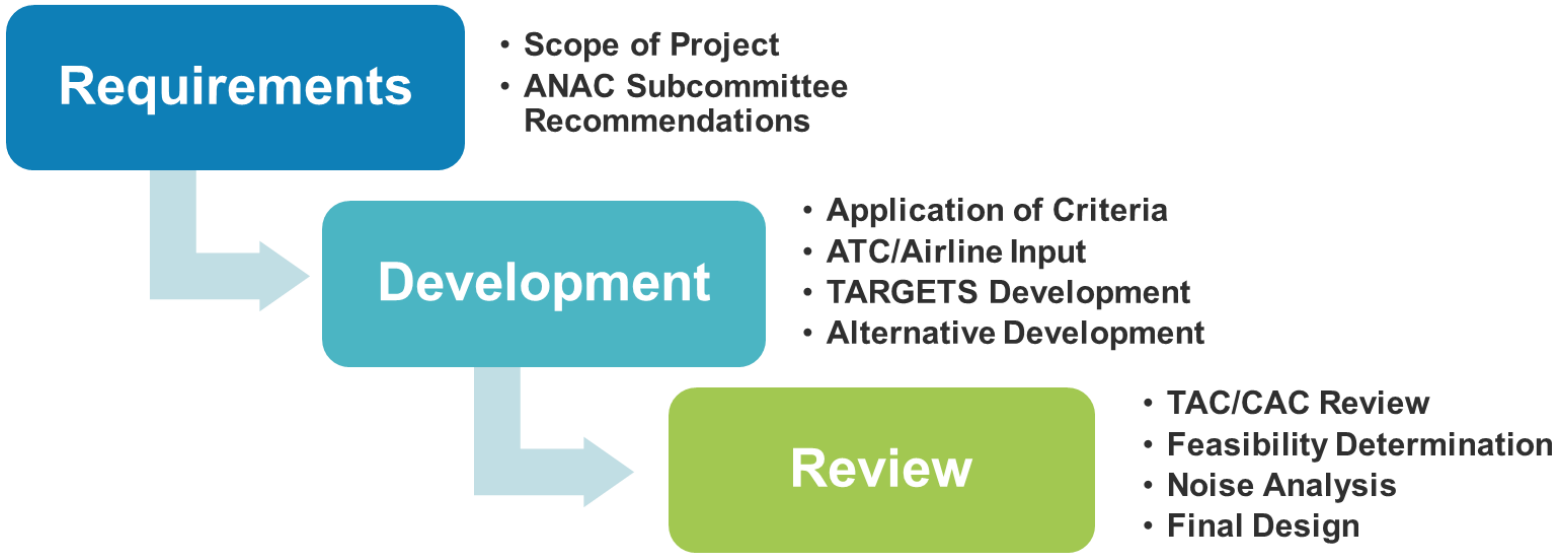
- **Scope of Project**
- **ANAC Subcommittee Recommendations**

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

SDIA Conceptual Flight Procedure Analysis Processes

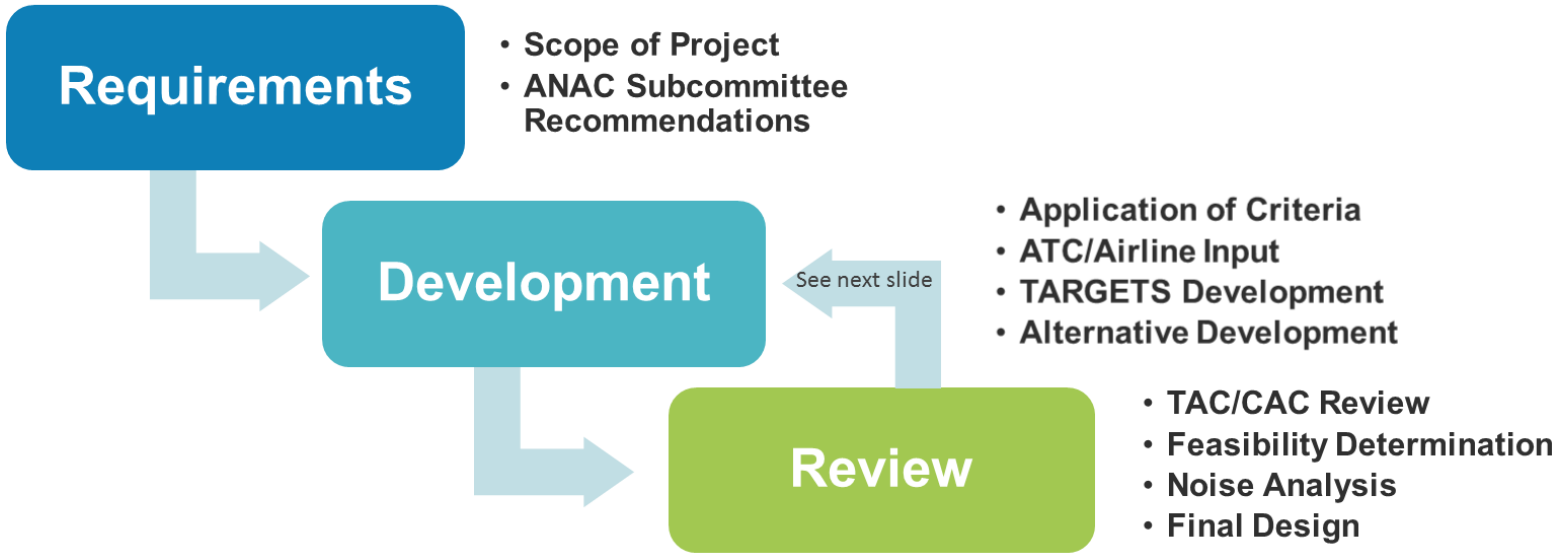
SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

SDIA Conceptual Flight Procedure Analysis Processes



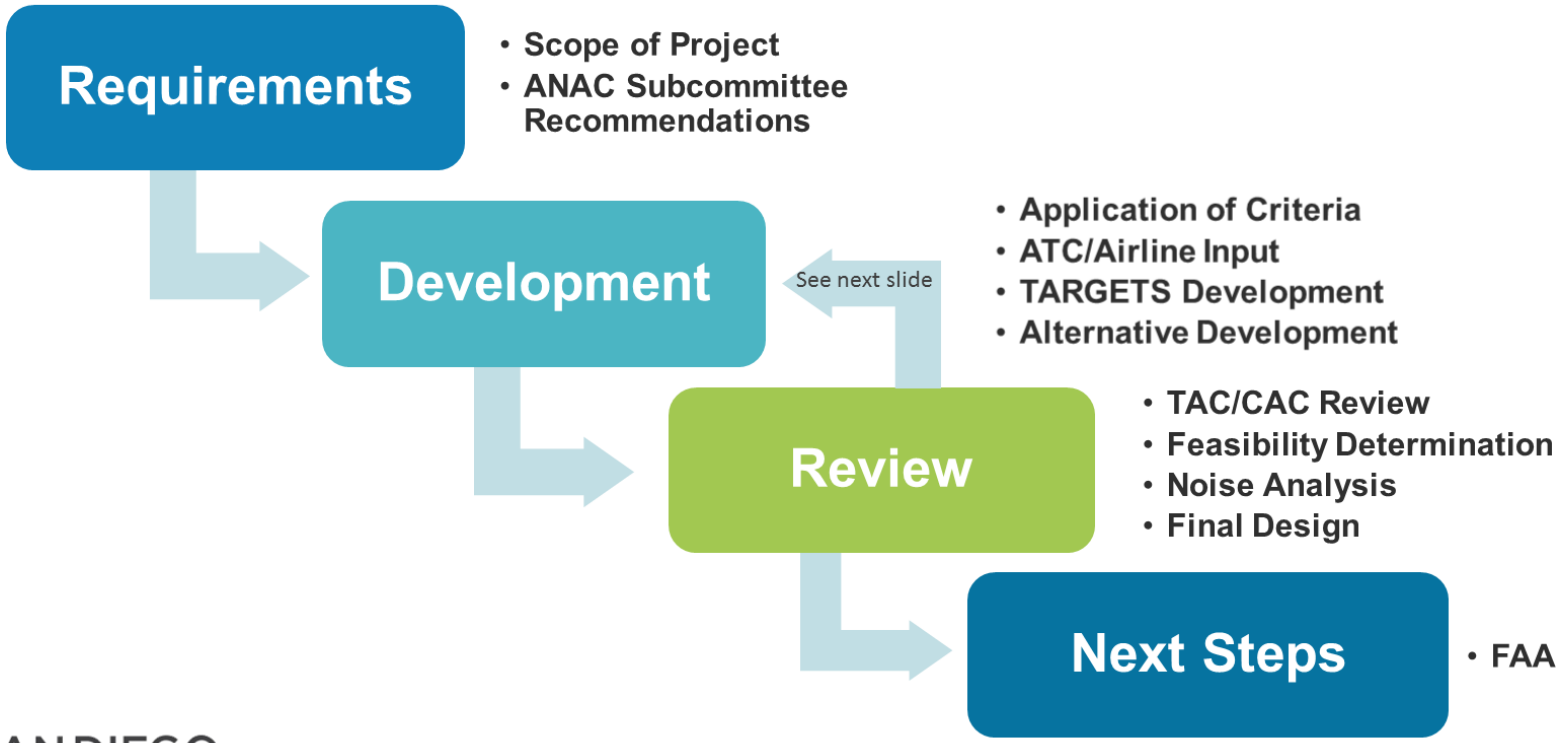
SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

SDIA Conceptual Flight Procedure Analysis Processes



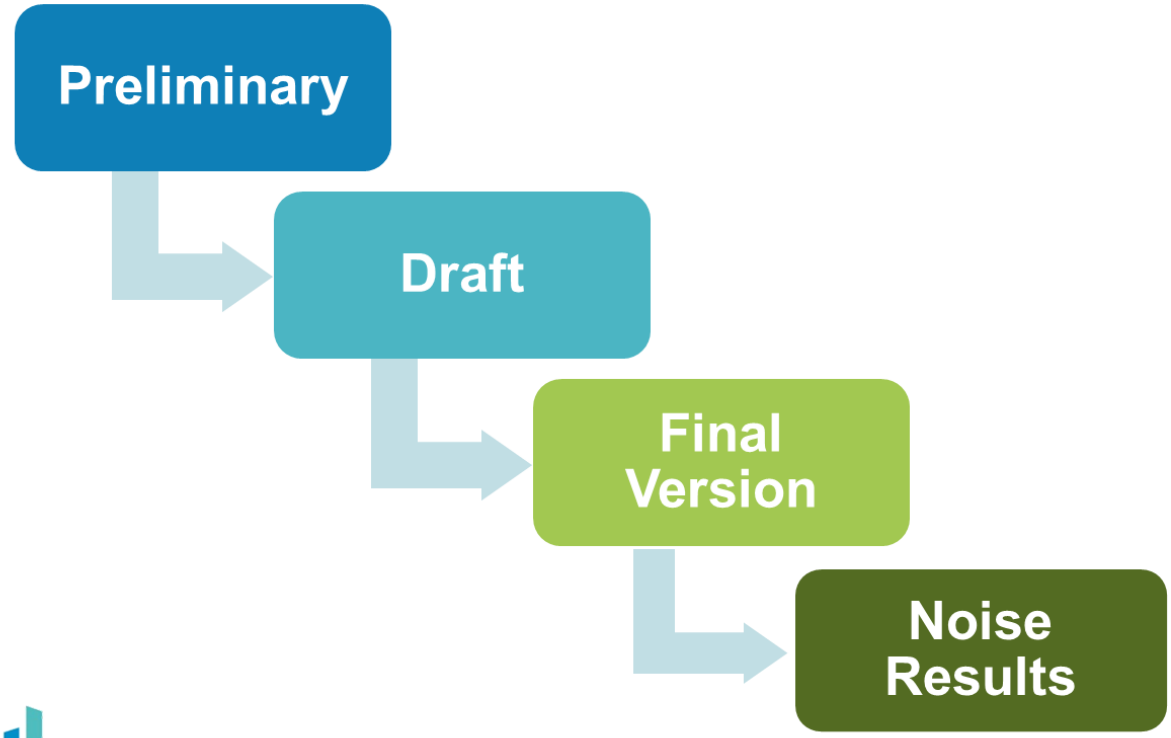
SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

SDIA Conceptual Flight Procedure Analysis Processes



SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Development/Review Steps



Preliminary

Design concept procedures within parameters that meet intent of ANAC recommendations. If a design is not possible to address a recommendation, reasons will be documented.

Draft

Consider input from TAC on Version 1 designs and adjust where possible. Reasons for input that cannot be accommodated will be documented.

Final

Consider input from CAC and TAC on Version 2 designs and adjust where possible. Reasons for input that cannot be accommodated will be documented.

Noise Results

Calculate noise on Final Version designs and compare with Baseline levels to determine potential change. Review final designs and noise changes with CAC and TAC.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

7100.41 Phase 1 - Preliminary Activities

A Process to Evaluate Safety, Risk, Benefit, Feasibility, Readiness, and Performance

Initial Coordination

- Does the Proposal Meet FAA Goals and Objectives? If Yes, Baseline Analysis. If No, STOP

Baseline Analysis

- Analysis of Baseline Data and Benefits
- Does the Proposal Meet FAA Goals and Objectives? If Yes, Go to Development Phase. If No, Re-evaluate Baseline Analysis or STOP

Approval

- If Accepted go to Development Phase. If Not Accepted Back to Baseline Analysis or STOP

SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

Process - Concept Design

Design Parameters

- Do not change aircraft flight paths over areas exposed to CNEL 65 or higher
- Do not impact safety
- Meet FAA design criteria
- Fit within existing airspace and maintain existing airspace hand-off areas
- Do not impact capacity of SDIA
- Do not move noise to new non-compatible areas

Operations Data and Design Tool

- Evaluate post-Metroplex operations
- Use FAA's Terminal Area Route Generation, Evaluation and Traffic Simulation (TARGETS) design tool to design concept procedures.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Process - Aircraft Noise Analysis

Methodology: Use Aviation Environmental Design Tool (AEDT)

- Use FAA ATO methodology to assess potential impacts
- Calculate noise levels for closely-spaced grid points
- Analyze difference between alternative and baseline

Flight Track and Operation Patterns

- Develop AEDT flight tracks and altitude profiles for traffic flows based on best radar and flight operations data

Noise Model Outputs

- Calculate Community Noise Equivalent Noise Level (CNEL)
- Calculate change in DNL and CNEL between an alternative and the baseline.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Important Factors

Will:

- Propose designs compatible with existing air traffic environment
- Gather critical input from CAC and TAC during design process
- Coordinate with FAA ATO staff during concept design process
- Develop required information for FAA consideration the “Preliminary Activities” phase of the FAA Order 7100.41a process, if necessary
- Calculate change in noise levels for specific procedures

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Important Factors

Will not:

- Evaluate recommendations to reduce noise at or higher than CNEL 65 dBA – reserved for Part 150 Study
- Propose designs that require FAA waivers
- Propose designs that will negatively impact SDIA capacity
- Conduct all steps in FAA Order 7100.41A
- Evaluate non-SDIA traffic overflights
- Evaluate “restriction” type proposals that require 14 CFR Part 161 study

SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

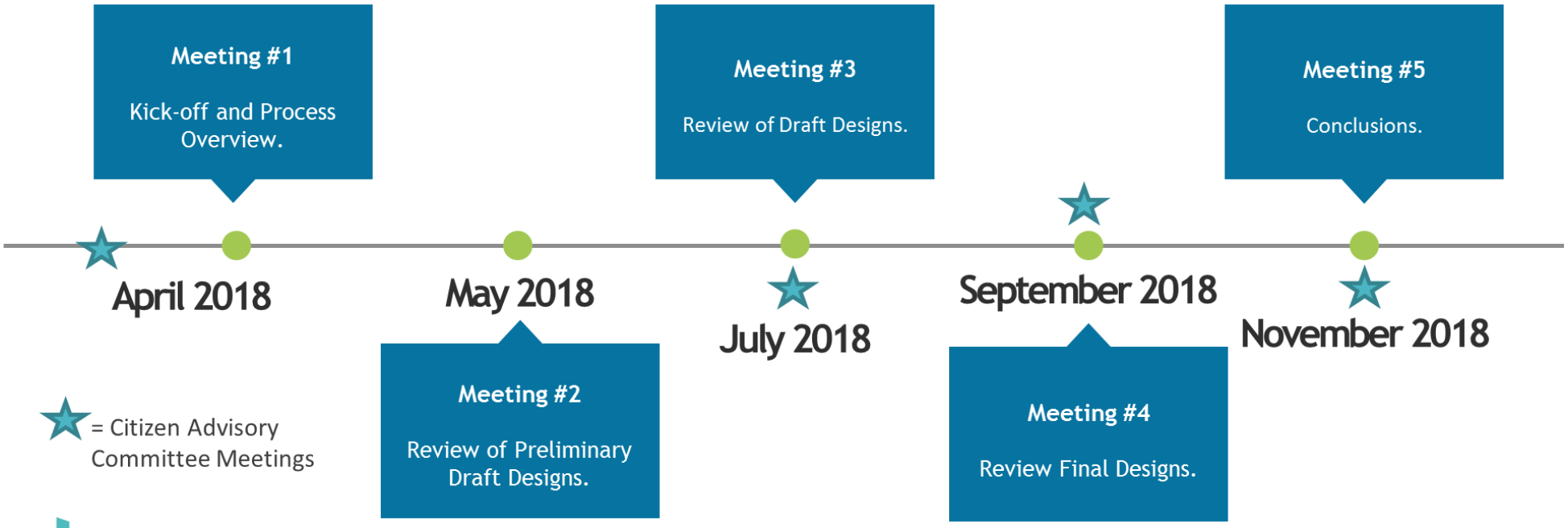
Process - Stakeholder Input

- Citizen Advisory Committee (CAC)
  - Input on ANAC recommendations and related goals
  - At least two meetings to review draft/final concepts
  - One meeting to review conclusions
- Technical Advisory Committee (TAC)
  - Broader stakeholder group: Airline(s), commuter carrier(s), corporate operator(s) and FAA ATO.
  - Input to confirm procedures are operationally viable and identify potential issues
  - At least three meetings to review iterative/draft/final concepts
  - One meeting to review conclusions

SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

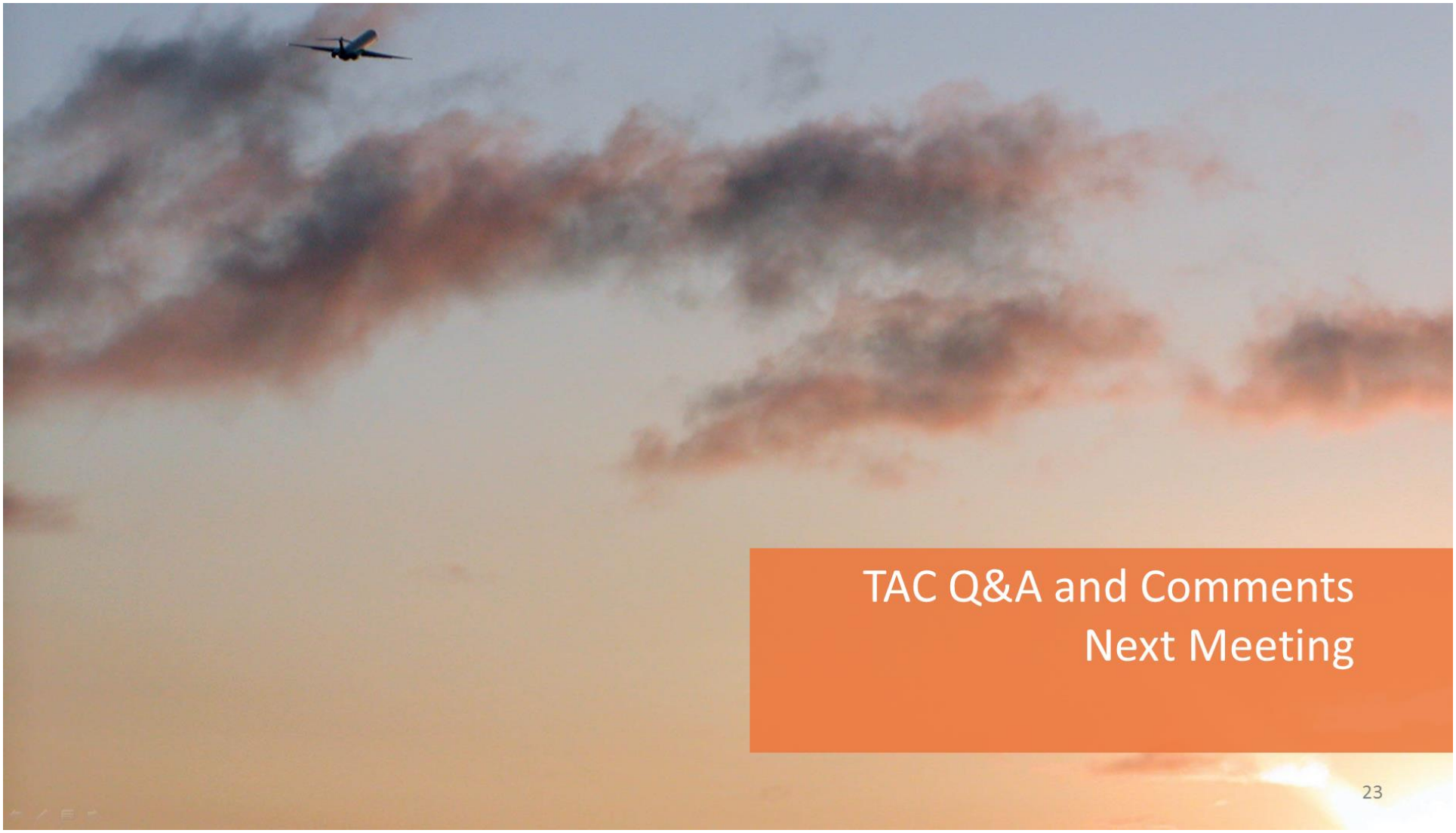
Anticipated Meeting Schedule

TAC Flight Procedure Analysis Meeting Timeline



= Citizen Advisory Committee Meetings

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.


TAC Q&A and Comments
Next Meeting

B.1.3 TAC MEETING #2 – MAY 31, 2018

San Diego County Regional Airport Authority (SDCRAA)
Flight Procedure Evaluation
Technical Advisory Committee Meeting #2

San Diego International Airport

May 31, 2018

DRAFT Deliberative Document – For Discussion Purposes Only

DRAFT Deliberative Document – For Discussion Purposes Only

Agenda

- Introductions
- Project Objectives
- Meeting Goals
- ANAC Recommendation 14 Design Concepts
- ANAC Recommendation 15 Design Concepts
- ANAC Recommendation 16 Design Concepts
- Next Steps

DRAFT Deliberative Document – For Discussion Purposes Only

Introductions to Design Team

- Steve Smith – Ricondo, Project Manager
- Robert Varani – Ricondo, RNAV Procedure Concept Lead
- Kevin L. Markwell – Ricondo, Air Traffic Control Operations Lead

Project Objectives

- Evaluate and determine feasibility of potential procedure designs to meet the intent of ANAC recommendations
- Provide preliminary design concepts for RNAV SIDS and STARS based on:
  - Safety
  - FAA Performance Based Navigation (PBN) design criteria
  - FAA ATC Rules, Policies, and Procedures
- Conduct noise screening analysis on feasible alternatives
- Provide recommendations to SDCRAA

DRAFT Deliberative Document – For Discussion Purposes Only

Meeting Goals

- Review preliminary design concepts
- Gather technical input from Technical Advisory Committee on:
  - Achieving ANAC recommendation intent
  - Potential operational issues/concerns

Design Parameters

- Do not change aircraft flight paths over areas exposed to CNEL 65 or higher
- Do not impact safety
- Meet FAA design criteria
- Fit within existing airspace and maintain existing airspace hand-off areas
- Do not impact capacity of SDIA
- Do not move noise to new non-compatible areas

Acronyms

- DF = Direct to a Fix
- Kts = Knots
- MDA = Minimum Descent Altitude
- MVA = Minimum Vectoring Altitude
- MSL = Mean Sea Level
- NM = Nautical Miles
- PBN = Performance Based Navigation
- RNAV = Area Navigation
- RNP = Required Navigational Performance
- SIAP = Standard Instrument Approach Procedure
- SID = Standard Instrument Departure Procedure
- STAR = Standard Instrument Arrival Route
- TARGETS = Terminal Area Route Generation Evaluation and Traffic Simulation
- VA = Heading to an Altitude
- WP = Waypoint

ANAC Noise Recommendation 14 – Reduce Noise in Mission Beach, Pacific Beach, and La Jolla

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14

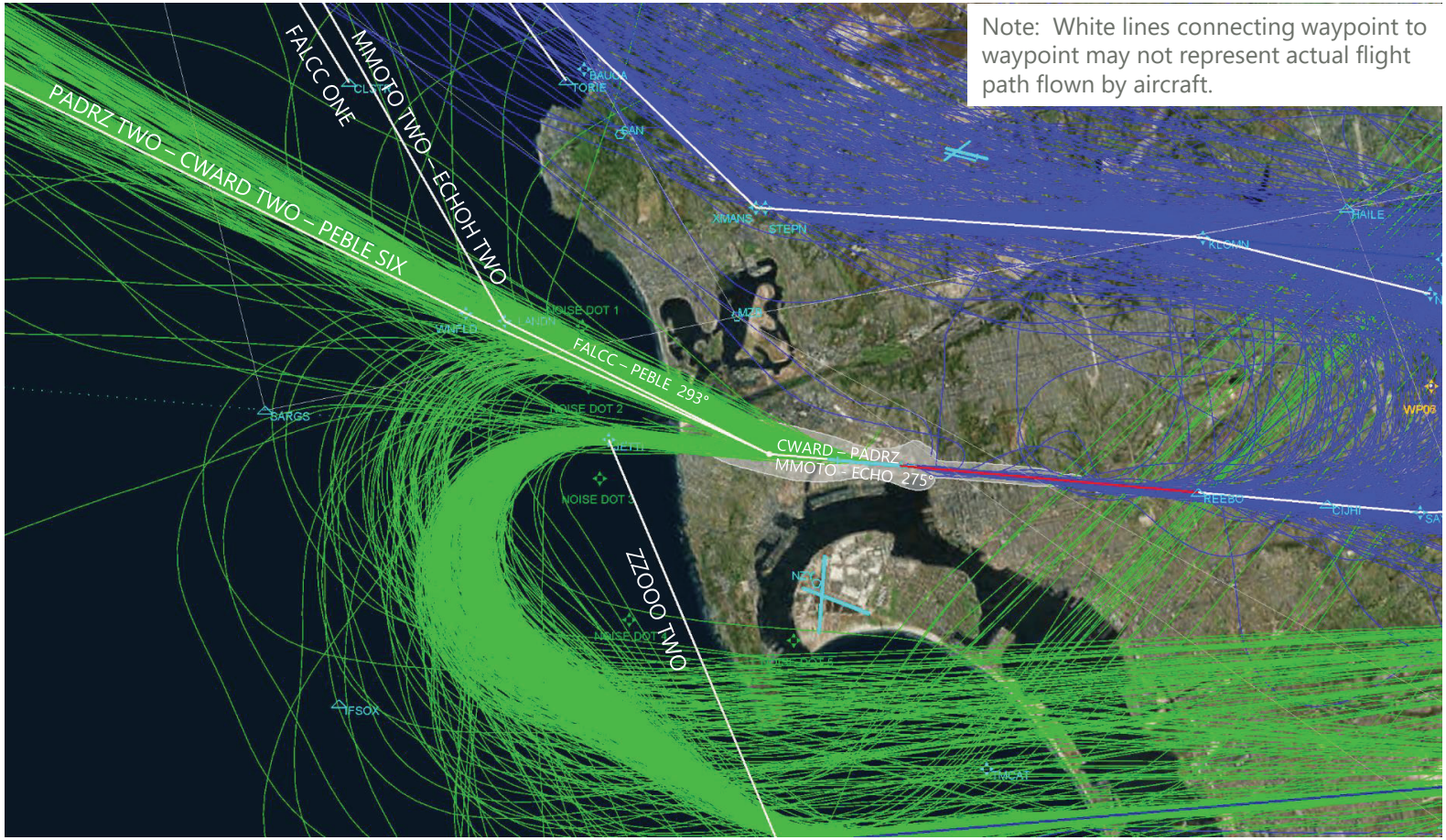
Revise PADRZ SID or create a new procedure to reduce increased noise in La Jolla, Mission Beach and Pacific Beach

☐ To be studied as part of the FAR Part 150 Study

1. Move the WNFLD and LANDN waypoints south so as to align with the relocated Noise Dot #1 at 290° (15° separation from JETTI at 275°) and designate as "Flyover" waypoints in their respective SID's, consistent with JETTI.
2. Establish within the PADRZ SID procedure a horizontal distance from end of runway (1.0 miles) along a fixed heading which must be satisfied along with altitude before a right turn can be initiated to preclude flights that quickly attain the current 520' altitude and turn right of and prior to Noise Dot #1 before correcting to WYNFLD which results in aircraft flying farther north over Mission Beach.
3. PADRZ ONE SID As currently designed the PADRZ ONE departure leaves aircraft very close to and almost paralleling the coast along La Jolla, increasing noise impacts significantly. We recommend moving the WNFLD and KERNL waypoints 1.5NM south of their current positions. This will ensure aircraft proceed more directly off the coast without paralleling the shore and adds less than a mile of track distance to PADRZ.
4. Create a new procedure: BROCK-1 (alternative 1) Request FAA to revise PADRZ SID and establish new waypoint BROCK1. Adds min increased flight time and takes aircraft further offshore before turning to northern destinations. This will help all coastal neighborhoods with noise issues.
5. Create a new procedure: BROCK-2 (alternative 2 - preferred) Relocate Waypoints WNFLD and LANDN 0.75 miles directly south or adopt BROCK recommendation. Maintain 274 Departure until Altitude 520 or greater. Maintain 274 departure heading until 520 foot altitude or greater and the aircraft have reached (new) flyover waypoint 0.25 to 0.5 miles from the end of the runway before turning towards WNFLD, LANDN or new BROCK Waypoint.
6. Do not move the PADRZ SID further south to avoid negative noise impacts on the south side communities of the Point Loma Peninsula.

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Existing Flight Tracks



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

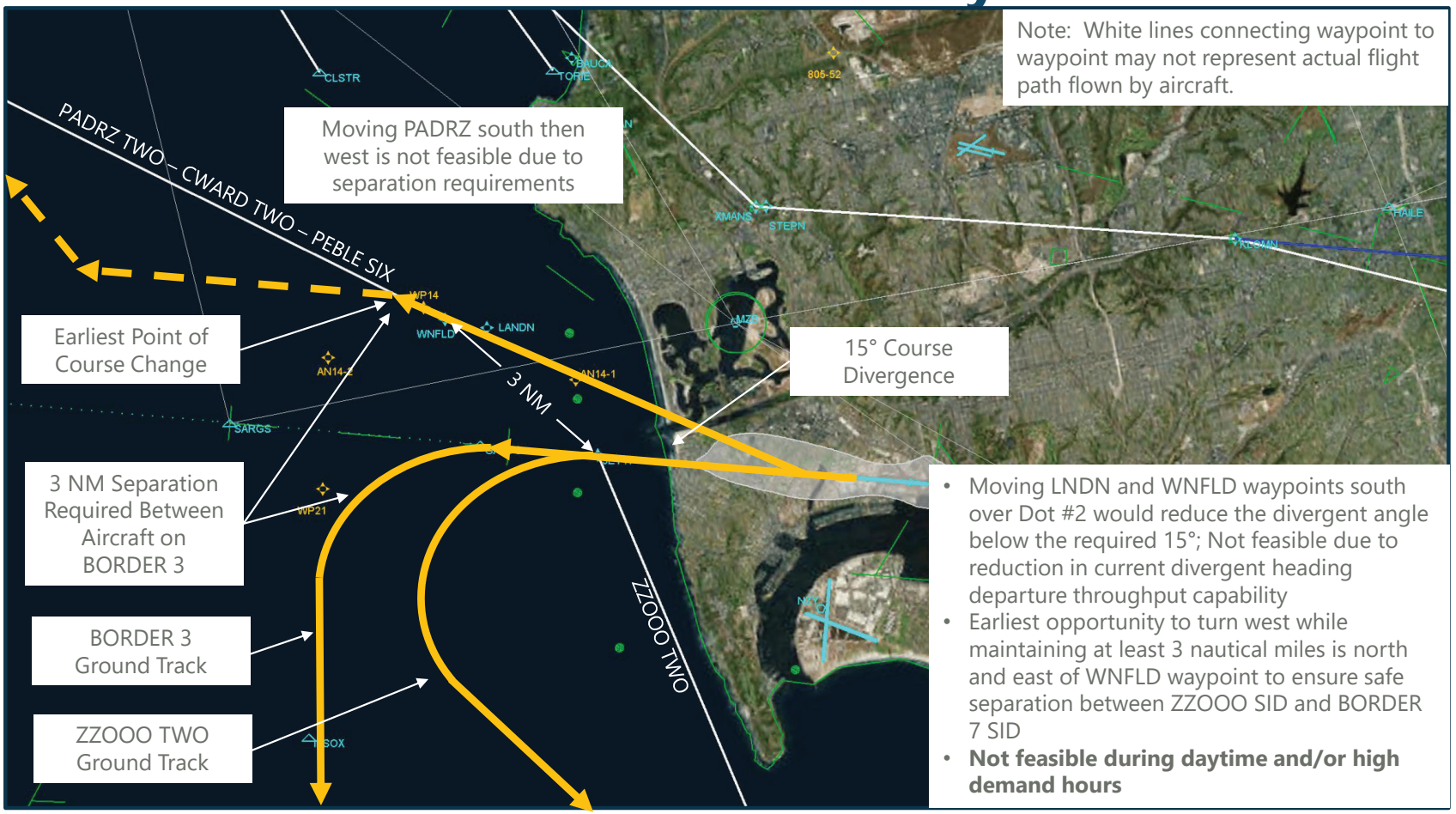
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Initial Review

1. *Move LNDN and WNFLD waypoint south in line with Dot #2*:
   - The magnetic heading from the departure end of Runway 27 is 287°, which is 12° from 275° heading. Moving LNDN and WNFLD waypoints south over Dot #2 would reduce the divergent angle below the required 15°.
   - Not feasible due to reduction in current divergent heading departure throughput capability
2. *Establish within the PADRZ SID procedure a horizontal distance from end of runway (1.0 miles) along a fixed heading which must be satisfied along with altitude before a right turn*: Change to initial heading design will be evaluated in FAR Part 150 Study
3. *Move WNFLD and KERNL waypoints 1.5 miles south of current location*:
   - If aircraft turn more westerly prior to reaching WNFLD, the divergence angle is no longer 15° ; therefore, the procedure must ensure aircraft heading south and north are laterally separated by 3 nautical miles (note: FAA ATC applies an additional buffer between 0.5 to 1 nautical mile to the 3 nautical mile requirement)
   - The earliest opportunity to turn west is north and east of WNFLD waypoint to ensure separation between ZZOOO SID and BORDER 7 SID
4. *Create BROCK-1 procedure*: Is not feasible during daytime hours for same reasons as #3 above, but a procedure similar to the BROCK recommendations for nighttime operations when all traffic is on a 290° heading (existing VA to DF coding) is feasible (see ANAC 14 Alternatives 1, 2 and 3)
5. *Create BROCK-2 procedure*: See #4 above

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Day Time Issues



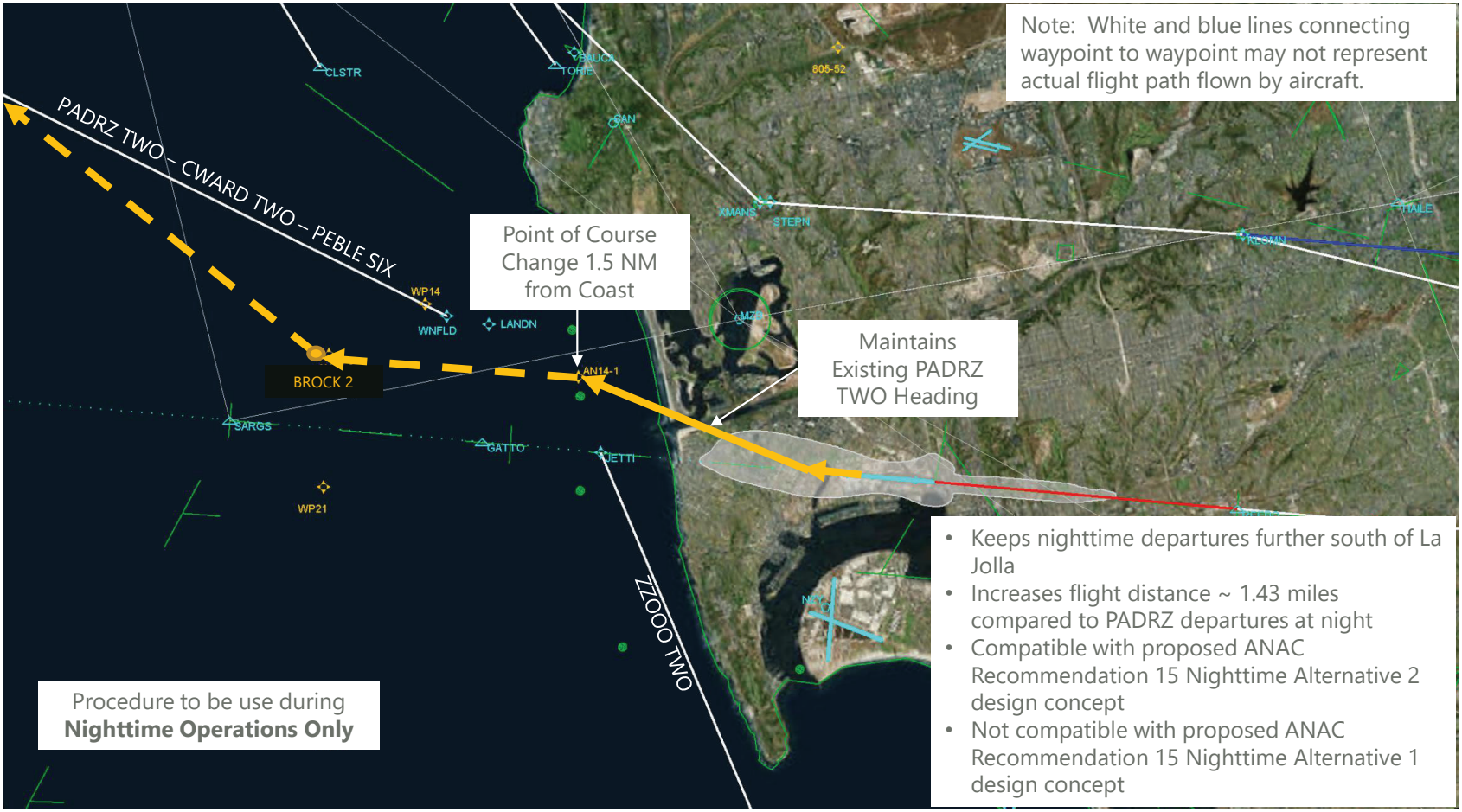
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Nighttime Alternatives

- Alternative 1 - Turn at 1.5 nautical mile (NM) from shoreline
  - Maintains existing initial departure design (VA to DF leg coding)
  - Consistent with FAA Dot agreement
  - Projected flight track on initial heading is consistent with current flight tracks
- Alternative 2 – Turn at shoreline
  - Maintains initial departure design (VA to DF leg coding)
  - Turn location prior to Noise Dot agreement
  - Projected flight track on initial heading is consistent with current flight tracks
- Alternative 3 – Turn at earliest point possible
  - Maintains existing initial departure design
  - Turn occurs where existing design (VA to DF leg coding) heading intersects the DNL 65 contour
  - Turn location prior to FAA Dot agreement
  - Projected flight track on initial heading strays from current flight tracks to the south (potential for change in DNL 65 area)
- All Alternatives not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

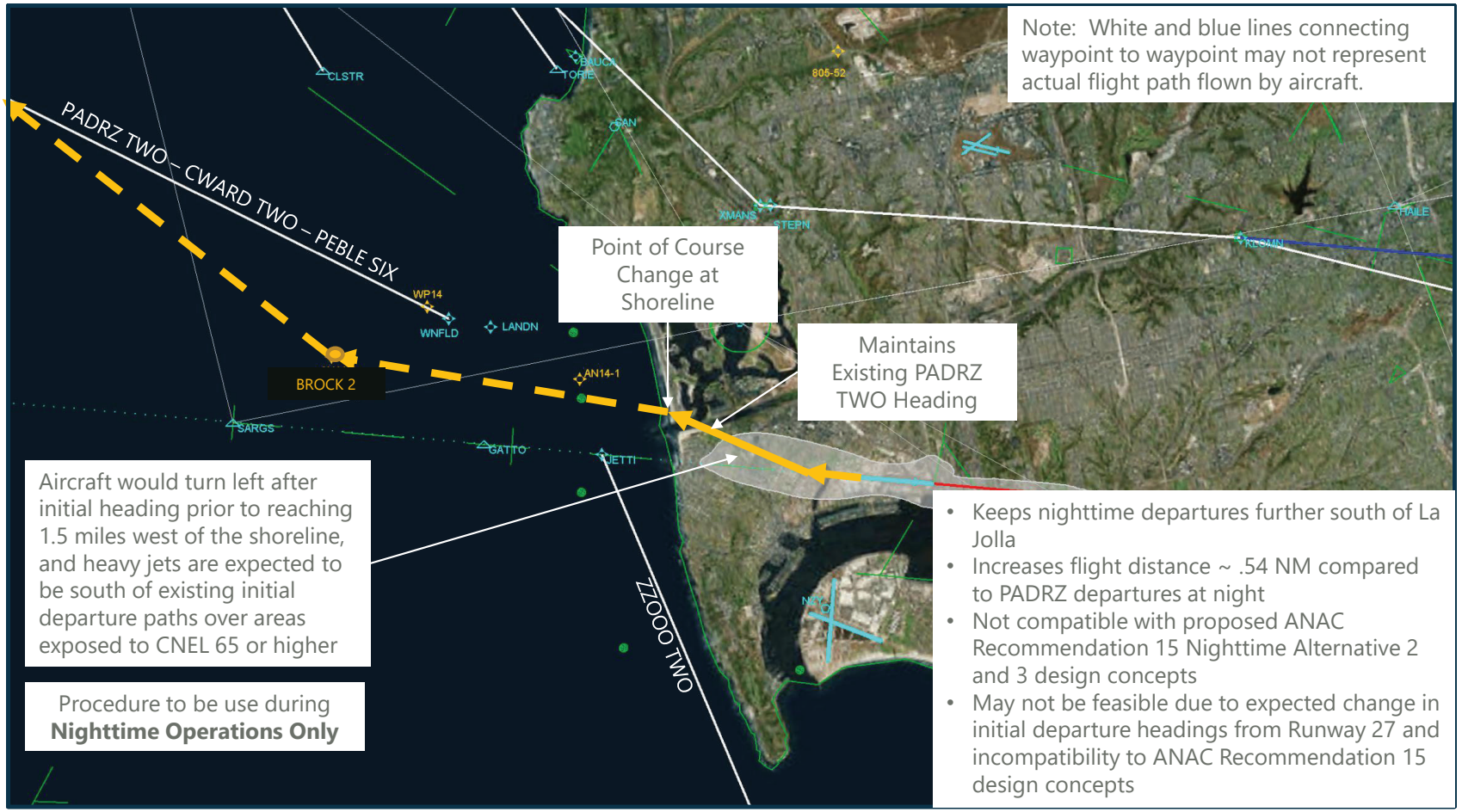
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Alt 1 Turn at 1.5 NM



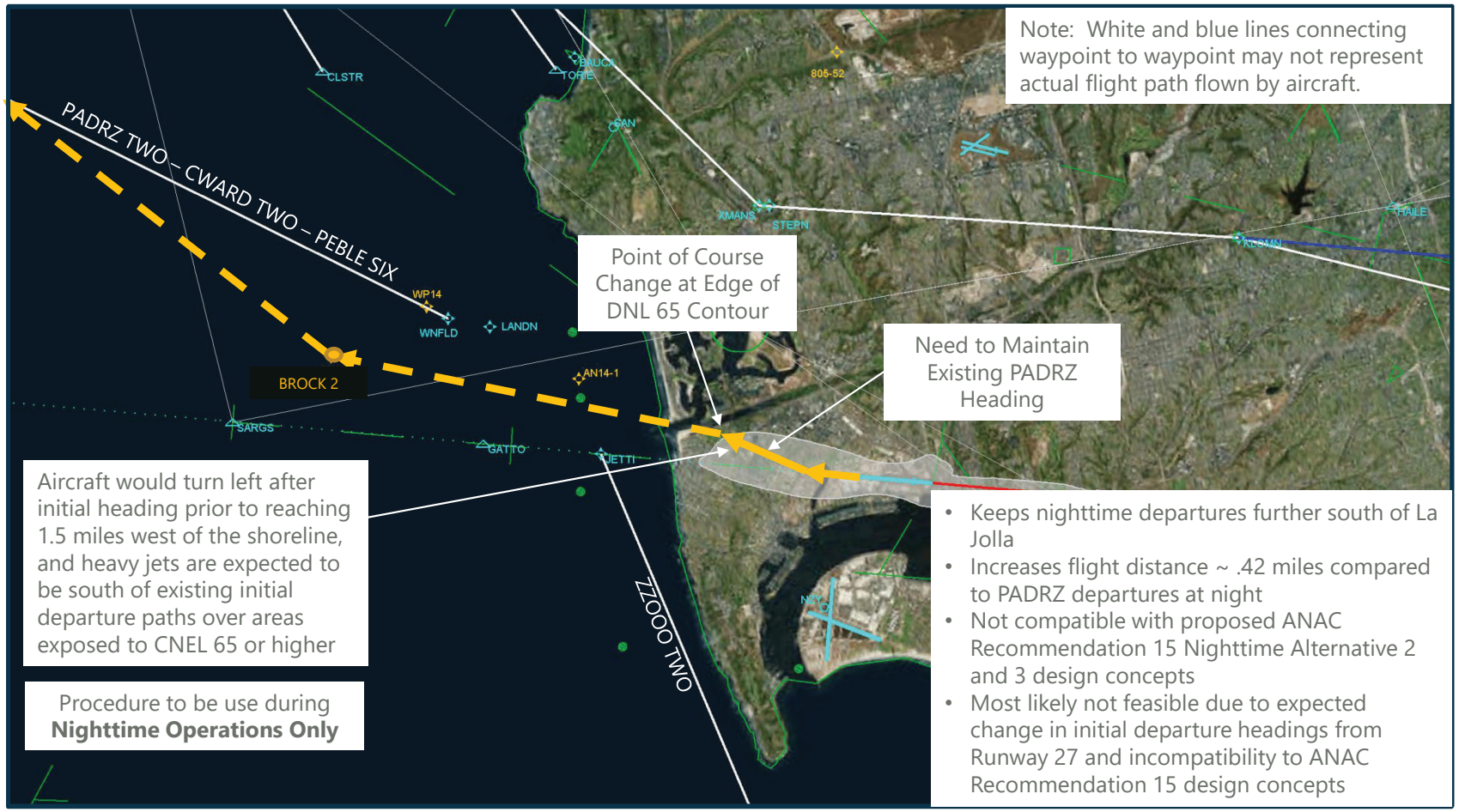
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Alt 2 Turn at Shoreline



DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Alt 3 Turn at DNL 65



ANAC Noise Recommendation 15 – Reduce Noise Over the Point Loma Peninsula and La Jolla

DRAFT Deliberative Document – For Discussion Purposes Only

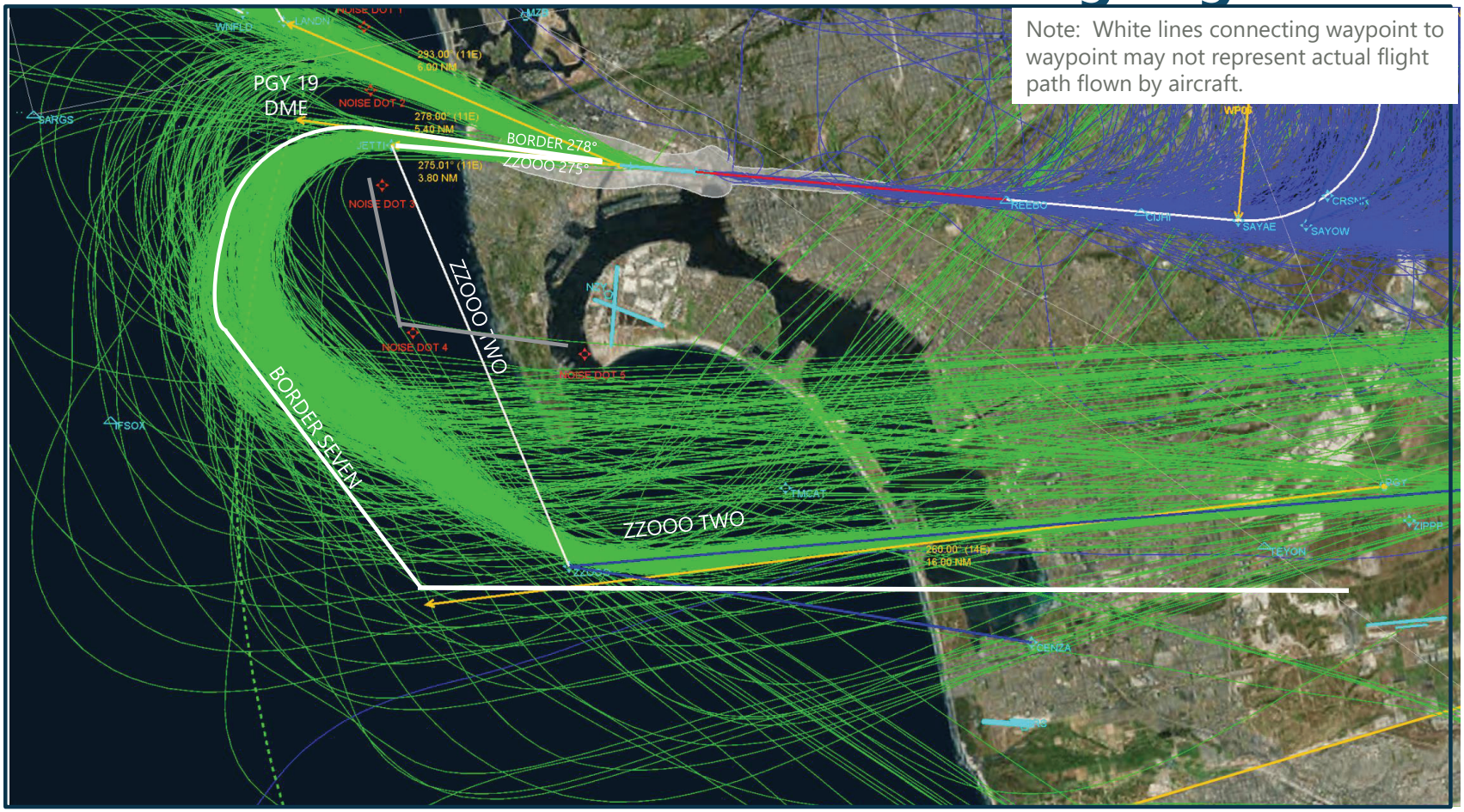
ANAC Noise Recommendation 15

Revise ZZOOO to significantly reduce or eliminate flights over the Point Loma Peninsula, including Cabrillo National Park and reduce or eliminate eastbound turns over La Jolla. ☐ To be studied as part of the FAR Part 150 Study

1. East bound flights should reach a minimum of 8K feet before crossing over ZZOOO to minimize thrusters and reduce duration of noise impacts over Point Loma.
2. FAA\TRACON to discourage the practice of redirecting flights off of their filed ZZOOO flight plan departure, to turn north then east over La Jolla. FAA to increase minimum SID flyover\flyby altitudes to encourage increased climb rates.
3. FAA\TRACON to direct that ALL SAN departure separation be limited to between JETTI (275°) and the historical Red Noise Dot #1 (290° vectors from the end of runway 27) for LNSAY, BORDER, PEBLE and ZZOOO, etc. (plus all new Metroplex SID's); Prohibit 250° to 275° departure vector range, except for specific safety events ("Runway 27 STAR Missed Approach Wave Off").
4. Follow ZZOOO procedure, comply with the JETTI flyover waypoint and consider the establishment of a minimum vectoring altitude for Eastbound turns.
5. The ZZOOO ONE departure as currently designed puts departing aircraft to close to the Point Loma peninsula and the southern end of coastal La Jolla, subjecting residents to increased and at times incessant noise from departing aircraft. Aircraft need to be further offshore before beginning the turn south to the ZZOOO waypoint. We recommend replacing the JETTI waypoint with a waypoint along the same track from the departure end of runway 27 that is 2 NM further west, located at approximately 32.75360N -117.25755W.

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Existing Flight Tracks



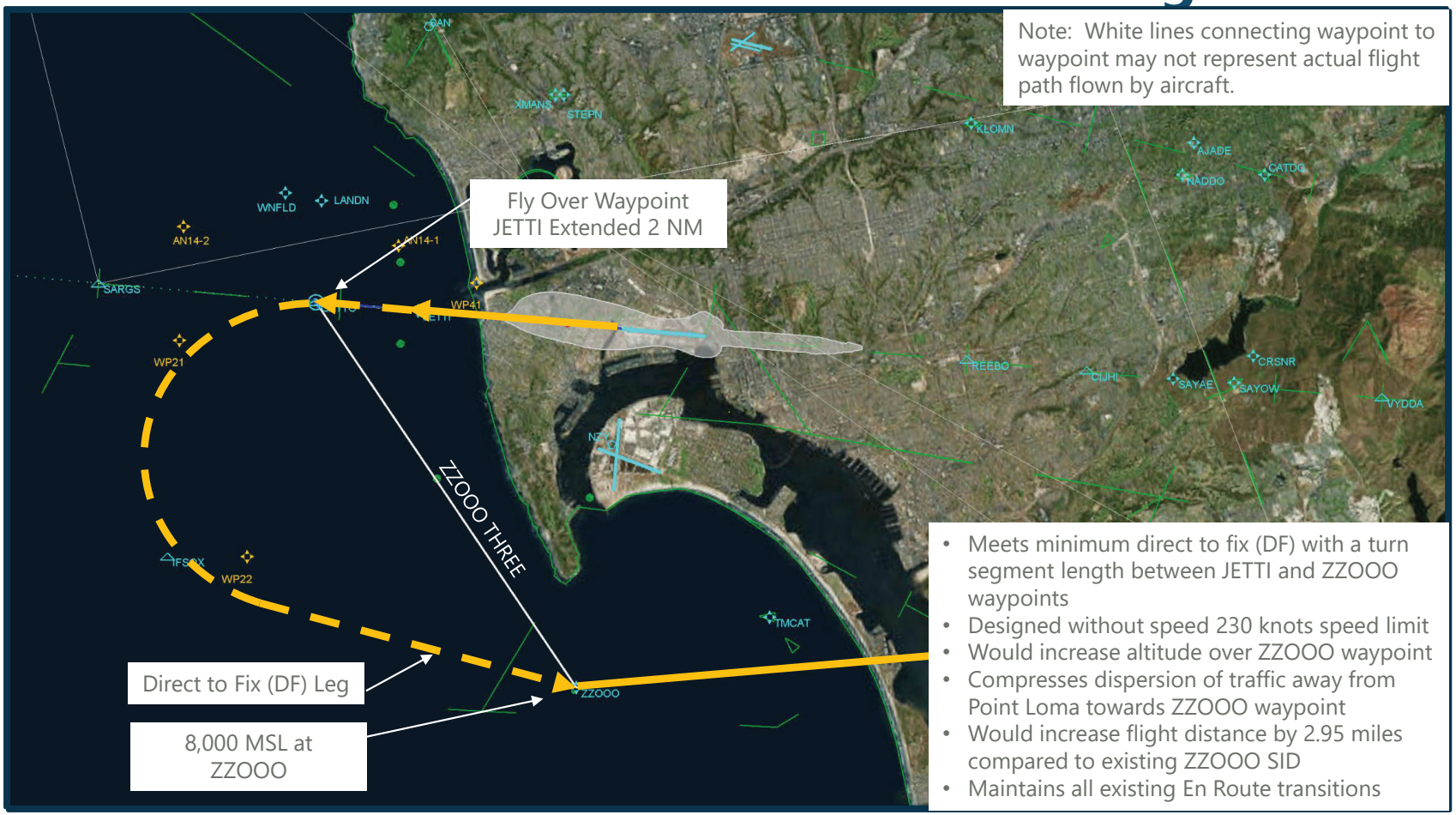
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Initial Review

1. *East bound flights should reach a minimum of 8K feet before crossing over ZZOOO*: A requirement of 8,000 MSL at ZZOOO waypoint is not feasible based on existing design of procedure, but may be possible if existing procedure design is modified (see ANAC 15 Alternative 1).
2. *Redirecting flights off of their filed ZZOOO flight plan departure, to turn north then east over La Jolla*: If an RNAV SID is implemented for eastbound departures on a directed 290° heading and thence directed towards ZZOOO waypoint, it would decrease frequency of traffic vectored north then east over La Jolla (ANAC 15 Alternatives 2 and 3 addresses this issue).
3. *Direct that ALL SAN departure separation be limited to between JETTI (275°) and the historical Red Noise Dot #1 (290° vectors from the end of runway 27)*: Initial or directed heading at departure to be addressed in FAR Part 150 Study.
4. *Comply with the JETTI flyover waypoint and consider the establishment of a minimum vectoring altitude for Eastbound turns*: ZZOOO SID complies with recommendation for flight paths within 275° heading. ZZOOO SID is an RNAV procedure and has no minimum vectoring altitudes (MVA). MVA is driven by obstacle clearance. If the intent is to raise the altitude on specific segments, MVA is not a feasible method.
5. *Aircraft need to be further offshore before beginning the turn south to the ZZOOO waypoint*: Increasing distance from Point Loma shoreline as aircraft turn back to the east would require a modification to ZZOOO SID design (see ANAC 15 Alternative 1). Moving the JETTI waypoint further west is intended to raise altitude over ZZOOO and increase distance from the Point Loma shoreline (see ANAC 15 Alternative 1).

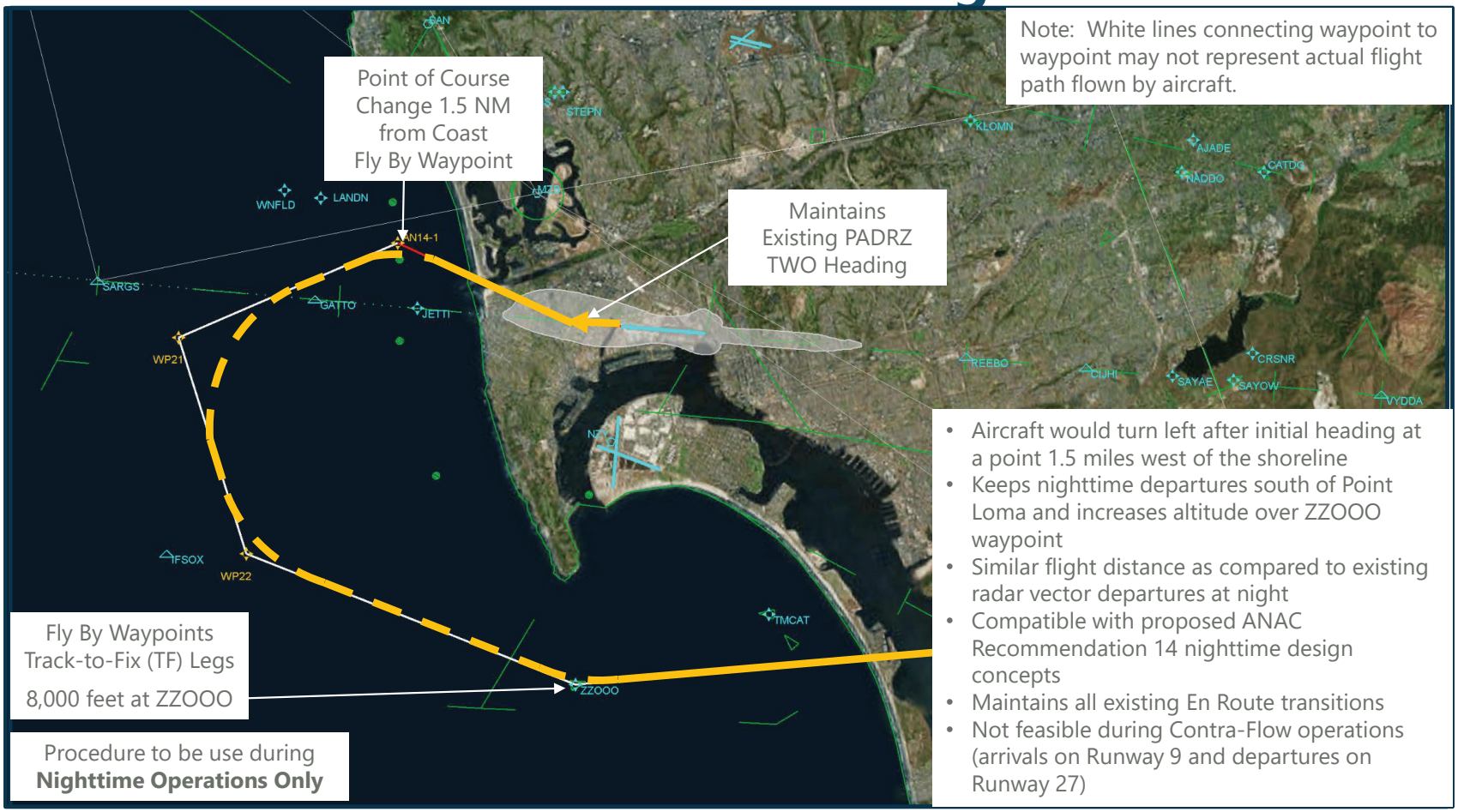
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Alt 1 Design



DRAFT Deliberative Document – For Discussion Purposes Only

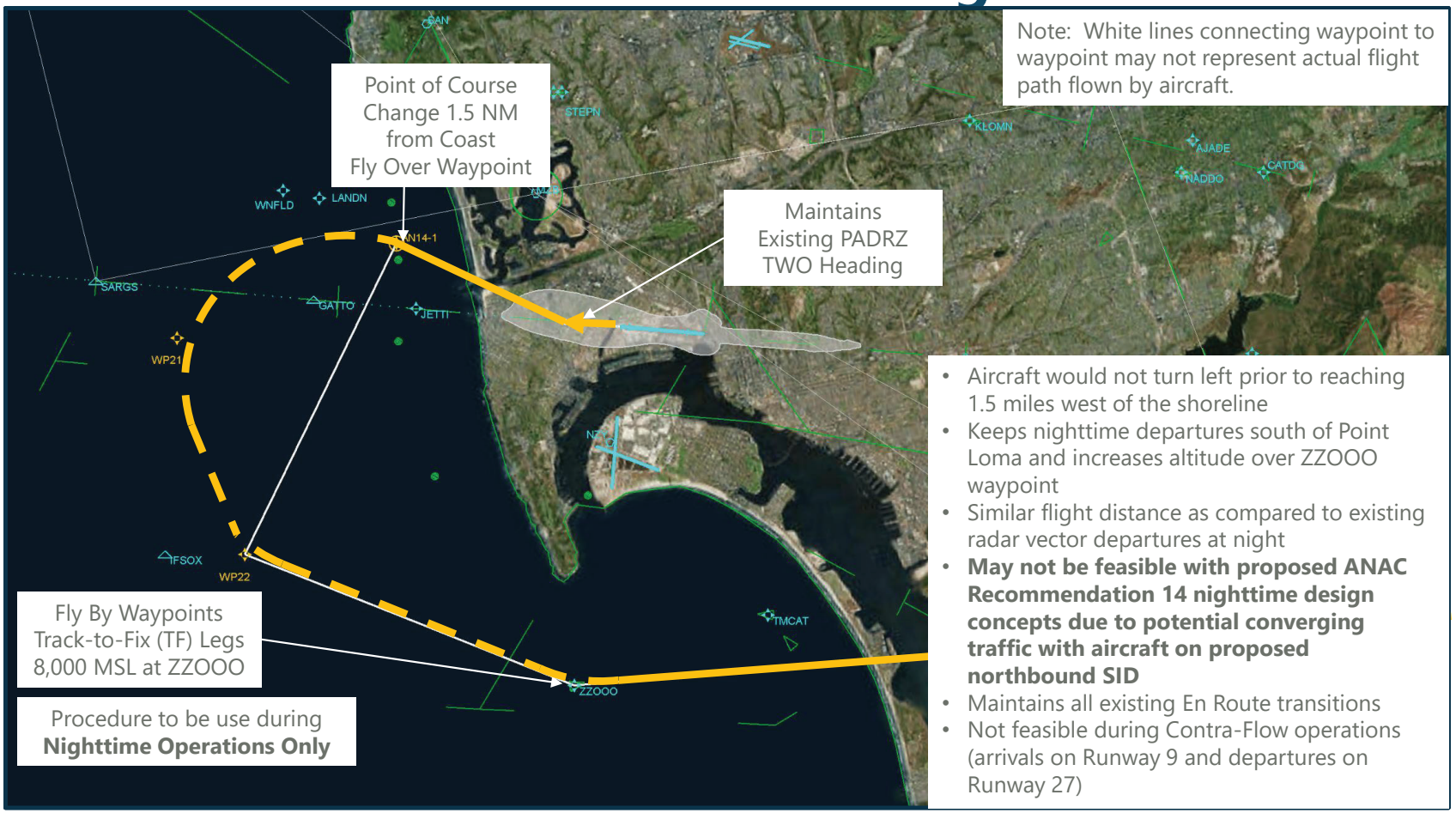
ANAC Noise Recommendation 15 – Night Alt 2



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

- Aircraft would turn left after initial heading at a point 1.5 miles west of the shoreline
- Keeps nighttime departures south of Point Loma and increases altitude over ZZOOO waypoint
- Similar flight distance as compared to existing radar vector departures at night
- Compatible with proposed ANAC Recommendation 14 nighttime design concepts
- Maintains all existing En Route transitions
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

ANAC Noise Recommendation 15 – Night Alt 3



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

- Aircraft would not turn left prior to reaching 1.5 miles west of the shoreline
- Keeps nighttime departures south of Point Loma and increases altitude over ZZOOO waypoint
- Similar flight distance as compared to existing radar vector departures at night
- **May not be feasible with proposed ANAC Recommendation 14 nighttime design concepts due to potential converging traffic with aircraft on proposed northbound SID**
- Maintains all existing En Route transitions
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

ANAC Noise Recommendation 16 – Reduce Arrival Noise Over La Jolla and East County Communities

DRAFT Deliberative Document – For Discussion Purposes Only

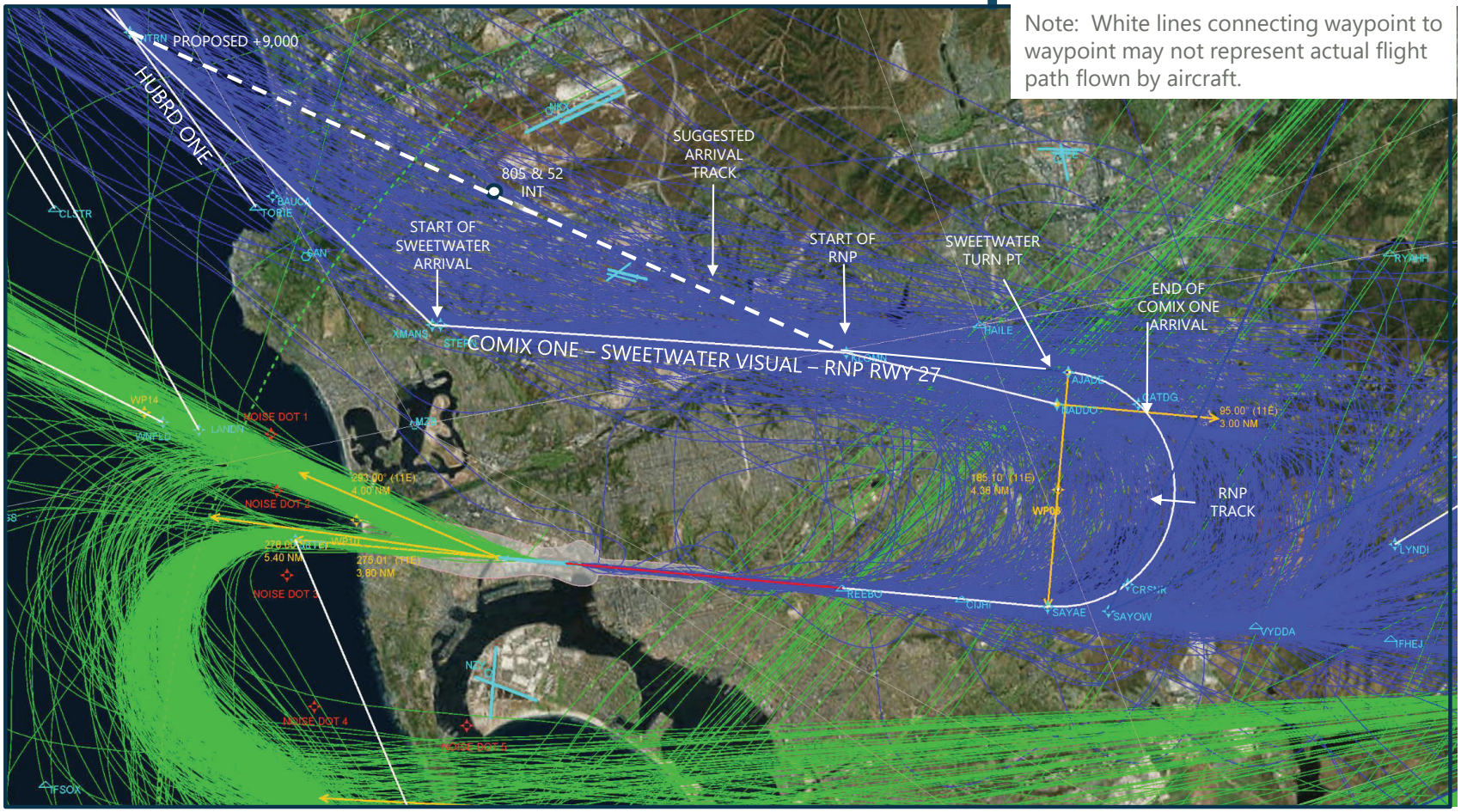
ANAC Noise Recommendation 16

Reassess and revise the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the North in a very narrow corridor.

1. Revise COMIX STAR procedure in order to shift flights that Metroplex has moved and concentrated farther South (the downwind leg) over less populated areas and restore prior altitude.
2. Shift the way point XMANS on the COMIX STAR north to a location that is over the interstate freeway 805 and 52 with the constraint to remain clear of MCAS Miramar's airspace. It would come ashore over Torrey Pines State Park before connecting with KLOMN.
3. Increase Min. Altitude at LNTRN (LCOVE) at or above 10,000. This change would result in aircraft flying over less populated areas, including industrial businesses, thus reducing the noise impact and saving time/fuel. This proposed path is closer to the historical flight tracks pre-NextGen.
4. COMIX ONE STAR: The RNAV-only COMIX ONE arrival is very similar to the existing non-RNAV BAYVU arrival in terms of ground track with a key difference being that the COMIX arrival has an "at or above 8,000 feet" altitude restriction on its last offshore waypoint (LANTRN). The BAYVU arrival has an "at or above 9,000 feet" restriction at its nearly identically-located LCOVE waypoint. This has resulted in aircraft being lower and noisier over La Jolla. We recommend changing the LANTRN waypoint's altitude restriction to "at or above 9,000 feet".

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 16 - Graphic



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

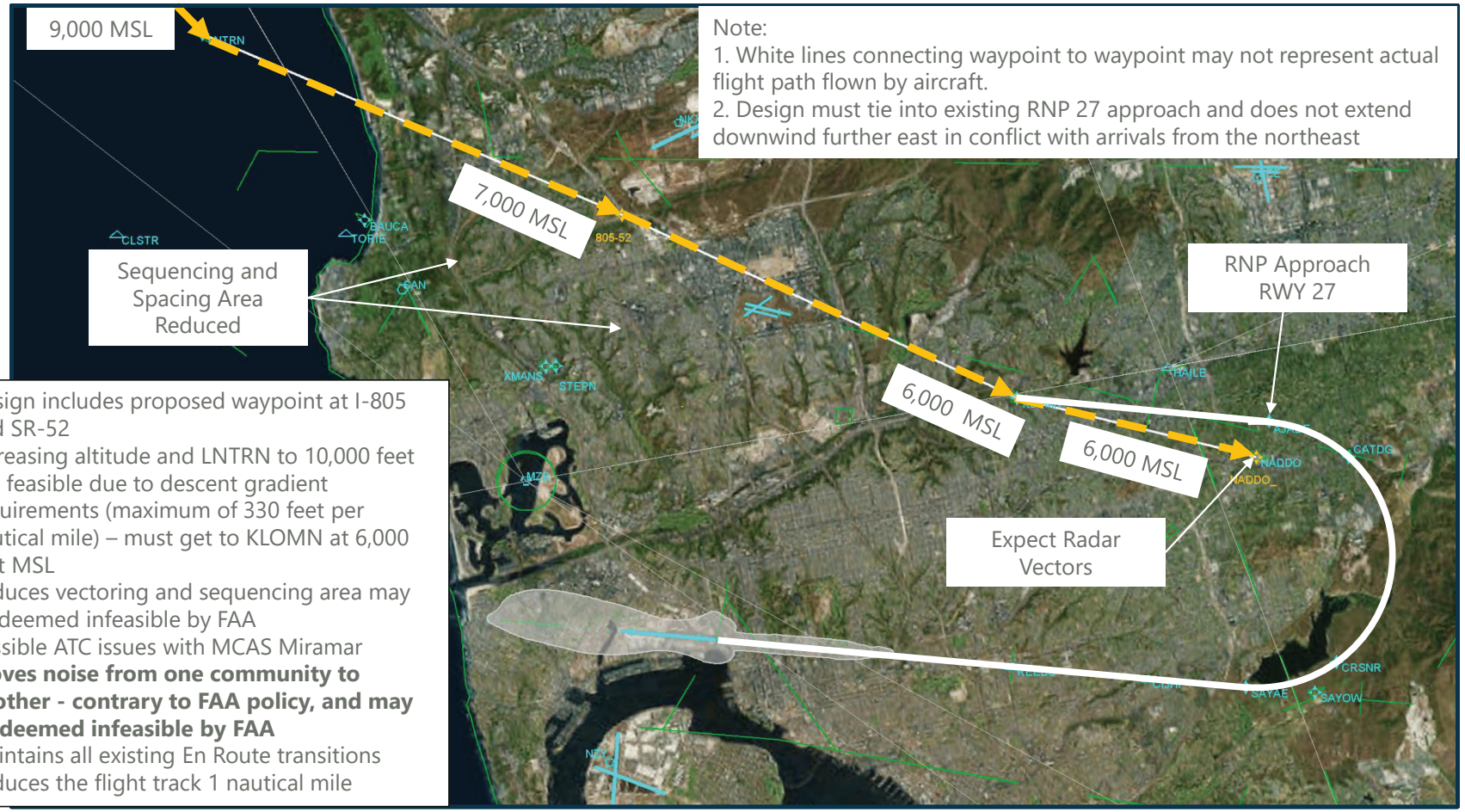
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 16 – Initial Review

1. *Revise COMIX STAR procedure in order to shift flights over less populated areas and restore prior altitude*: Leg between KLOMN waypoint to NADDO waypoint was designed to prevent Class B airspace excursions. This leg cannot be changed until the Class B redesign is complete. Path may be modified post Class B design.
2. *Shift the way point XMANS on the COMIX STAR north to a location that is over the interstate freeway 805 and 52*: Crossing the shoreline over Torey Pines State Park and heading to XMAN waypoint shifted north over I-805 and SR-52 would reduce the flight track 1 nautical mile (NM) (see ANAC Recommendation 16 Alternative 1 and 2)
   - Reduction in vectoring and sequencing area may be deemed infeasible by FAA
   - Possible ATC issues with Miramar Marine Corps Air Station
   - Moving noise from one community to another is contrary to FAA policy, and may be deemed infeasible by FAA – aircraft overflight location moved over another community and aircraft are lower in altitude
3. *Increase Min. Altitude at LNTRN (LCOVE) at or above 10,000*: Increasing LNTRN to 10,000 feet is not feasible based on current design
   - Increasing to 10,000 feet would exceed the descent gradient criteria (maximum of 330 feet per nautical mile) from LNTRN to KLOMN waypoint at 6,000 feet MSL along the existing COMIX path.
   - Increasing altitude at LNTRN to 10,000 feet along route shifted north would also exceed descent gradient criteria.
4. *Change the LANTRN waypoint's altitude restriction to "at or above 9,000 feet"*: According to FAA information posted on the FAA Instrument Flight Procedure Gateway Production page for SAN, the COMIX TWO STAR is expected raise the altitude from at or above 8,000 to at or above 9,000 feet at the LNTRN waypoint.

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 16 – Alt 1

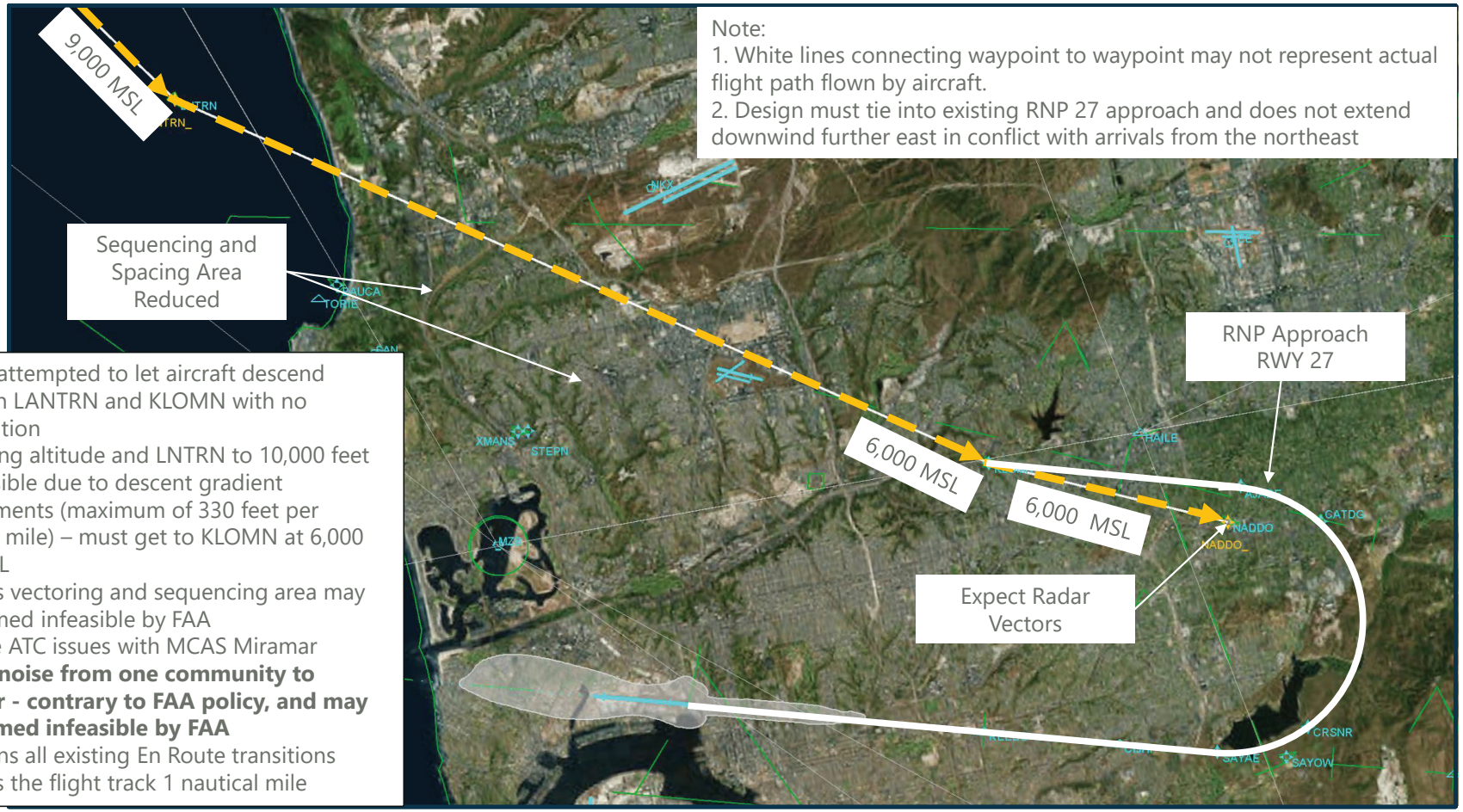


Note:
1. White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.
2. Design must tie into existing RNP 27 approach and does not extend downwind further east in conflict with arrivals from the northeast

- Design includes proposed waypoint at I-805 and SR-52
- Increasing altitude and LNTRN to 10,000 feet not feasible due to descent gradient requirements (maximum of 330 feet per nautical mile) – must get to KLOMN at 6,000 feet MSL
- Reduces vectoring and sequencing area may be deemed infeasible by FAA
- Possible ATC issues with MCAS Miramar
- **Moves noise from one community to another - contrary to FAA policy, and may be deemed infeasible by FAA**
- Maintains all existing En Route transitions
- Reduces the flight track 1 nautical mile

DRAFT Deliberative Document – For Discussion Purposes Only

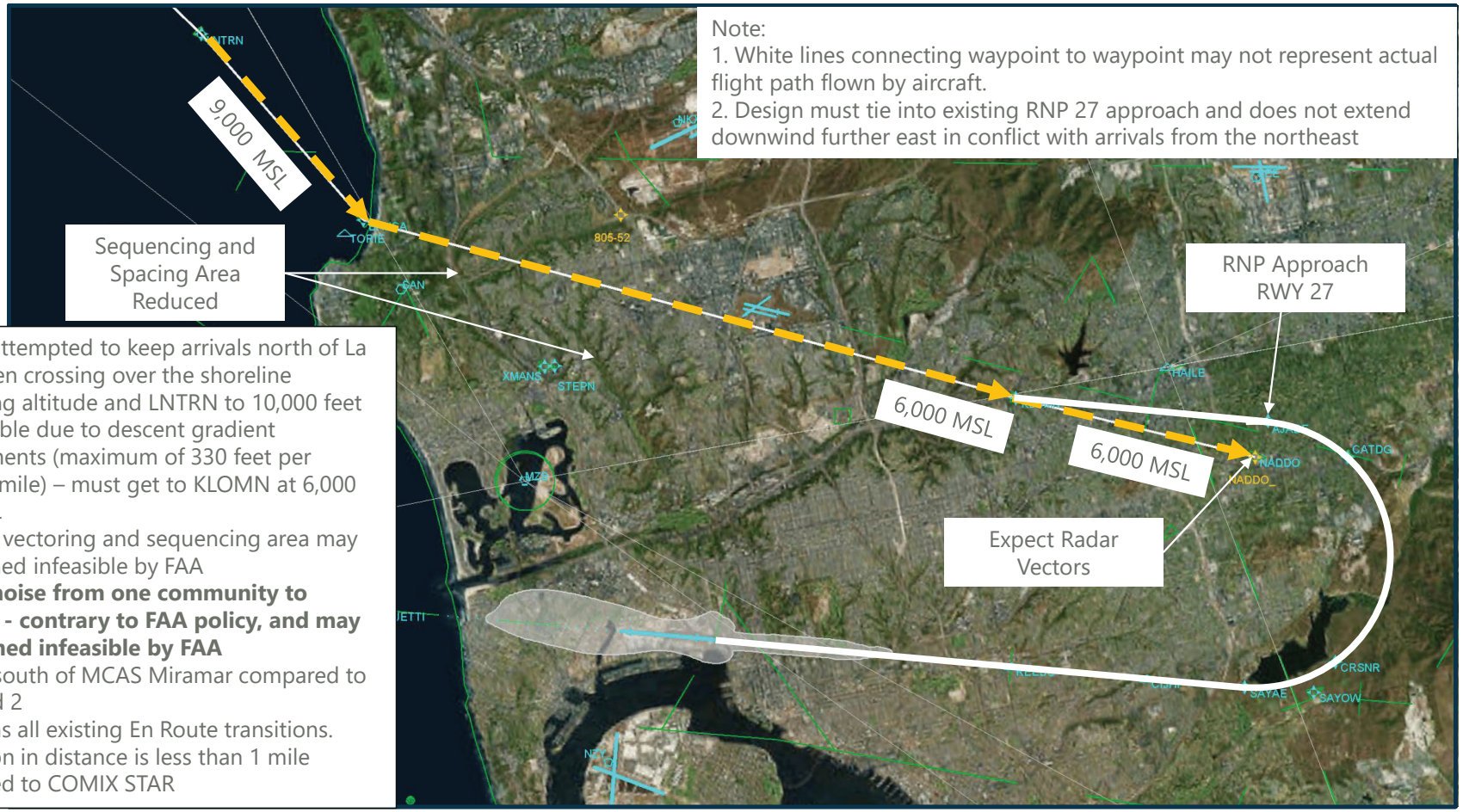
ANAC Noise Recommendation 16 – Alt 2



- Design attempted to let aircraft descend between LANTRN and KLOMN with no interruption
- Increasing altitude and LNTRN to 10,000 feet not feasible due to descent gradient requirements (maximum of 330 feet per nautical mile) – must get to KLOMN at 6,000 feet MSL
- Reduces vectoring and sequencing area may be deemed infeasible by FAA
- Possible ATC issues with MCAS Miramar
- **Moves noise from one community to another - contrary to FAA policy, and may be deemed infeasible by FAA**
- Maintains all existing En Route transitions
- Reduces the flight track 1 nautical mile

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 16 – Alt 3



- Design attempted to keep arrivals north of La Jolla when crossing over the shoreline
- Increasing altitude and LNTRN to 10,000 feet not feasible due to descent gradient requirements (maximum of 330 feet per nautical mile) – must get to KLOMN at 6,000 feet MSL
- Reduces vectoring and sequencing area may be deemed infeasible by FAA
- **Moves noise from one community to another - contrary to FAA policy, and may be deemed infeasible by FAA**
- Further south of MCAS Miramar compared to Alt 1 and 2
- Maintains all existing En Route transitions.
- Reduction in distance is less than 1 mile compared to COMIX STAR

Discussion

Next Steps – Action Items and Next TAC Meeting

B.1.4 CAC MEETING #2 – JULY 19, 2018

San Diego County Regional Airport Authority (SDCRAA)
Flight Procedure Evaluation
Citizen Advisory Committee Meeting #2

San Diego International Airport

July 19, 2018

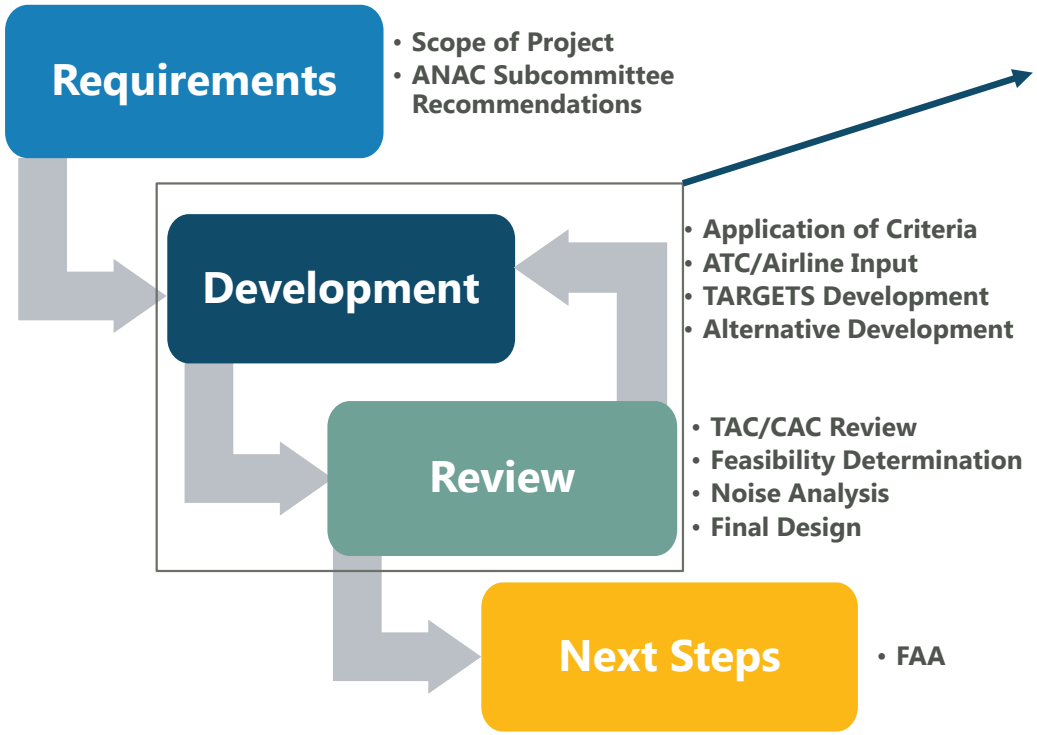
DRAFT Deliberative Document – For Discussion Purposes Only

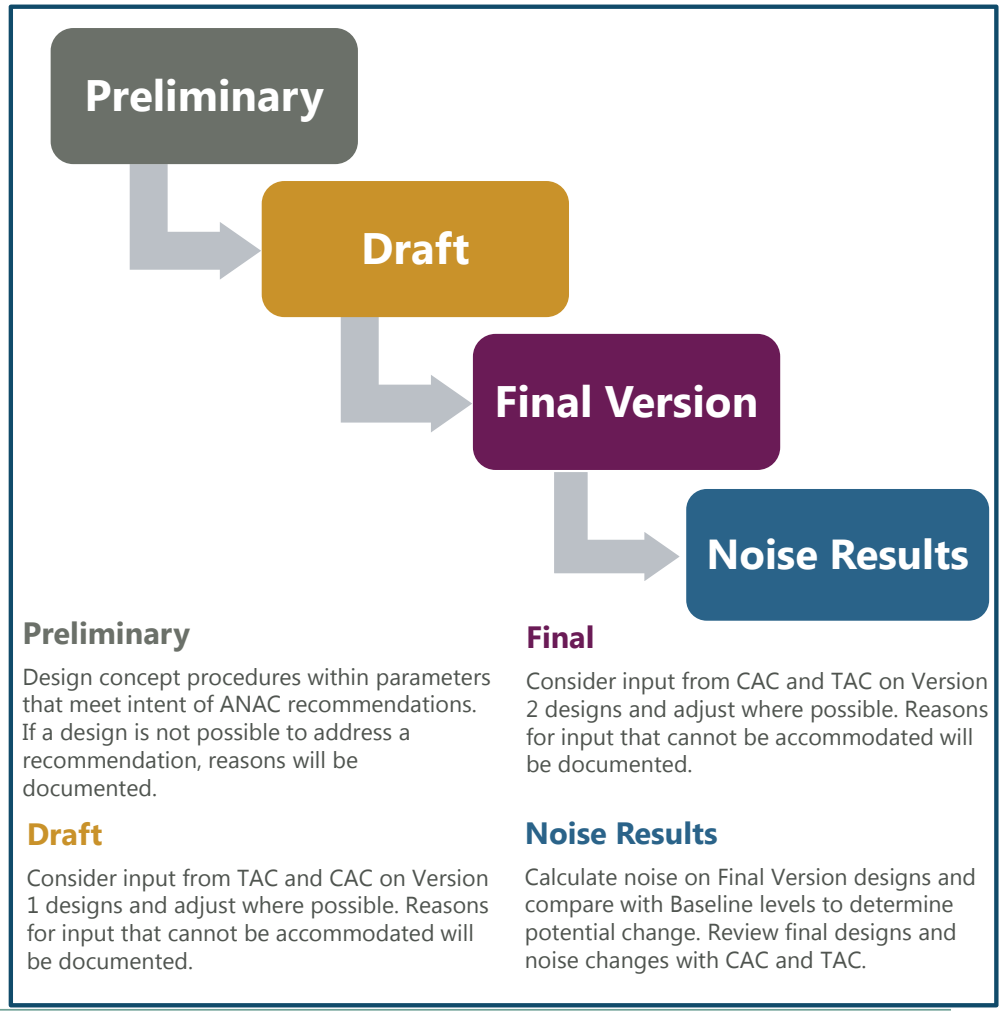
DRAFT Deliberative Document – For Discussion Purposes Only

Agenda

- Process
- Project Objectives
- Meeting Goals
- Design Parameters
- Acronyms
- ANAC Recommendation 14 Design Concepts and TAC Input
- ANAC Recommendation 15 Design Concepts and TAC Input
- ANAC Recommendation 16 Design Concepts and TAC Input
- Concept Designs - Process Considerations
- Next Steps

Process





Preliminary

Design concept procedures within parameters that meet intent of ANAC recommendations. If a design is not possible to address a recommendation, reasons will be documented.

Draft

Consider input from TAC and CAC on Version 1 designs and adjust where possible. Reasons for input that cannot be accommodated will be documented.

Final

Consider input from CAC and TAC on Version 2 designs and adjust where possible. Reasons for input that cannot be accommodated will be documented.

Noise Results

Calculate noise on Final Version designs and compare with Baseline levels to determine potential change. Review final designs and noise changes with CAC and TAC.

Project Objectives

- Evaluate and determine feasibility of potential procedure designs to meet the intent of ANAC recommendations
- Provide preliminary design concepts for RNAV SIDS and STARS based on:
  - Safety
  - FAA Performance Based Navigation (PBN) design criteria
  - FAA ATC Rules, Policies, and Procedures
- Conduct noise screening analysis on feasible alternatives
- Provide recommendations to SDCRAA

Meeting Goals

- Review preliminary design concepts
- Inform CAC of TAC input (so far) on preliminary designs
- Gather input from Citizen Advisory Committee on achieving ANAC recommendation intent

Design Parameters

- Do not change aircraft flight paths over areas exposed to CNEL 65 or higher
- Do not impact safety
- Meet FAA design criteria
- Fit within existing airspace and maintain existing airspace hand-off areas
- Do not impact capacity of SDIA
- Do not move noise to new non-compatible areas

Acronyms

- DF = Direct to a Fix
- ELSO = Equivalent Lateral Spacing Operations
- Kts = Knots
- MDA = Minimum Descent Altitude
- MVA = Minimum Vectoring Altitude
- MSL = Mean Sea Level
- NM = Nautical Miles
- PBN = Performance Based Navigation
- RNAV = Area Navigation
- RNP = Required Navigational Performance
- SIAP = Standard Instrument Approach Procedure
- SID = Standard Instrument Departure Procedure
- STAR = Standard Instrument Arrival Route
- TARGETS = Terminal Area Route Generation Evaluation and Traffic Simulation
- VA = Heading to an Altitude
- WP = Waypoint

ANAC Noise Recommendation 14 – Reduce Noise in Mission Beach, Pacific Beach, and La Jolla

DRAFT Deliberative Document – For Discussion Purposes Only

Updated Slide

ANAC Noise Recommendation 14

Revise PADRZ SID or create a new procedure to reduce increased noise in La Jolla, Mission Beach and Pacific Beach

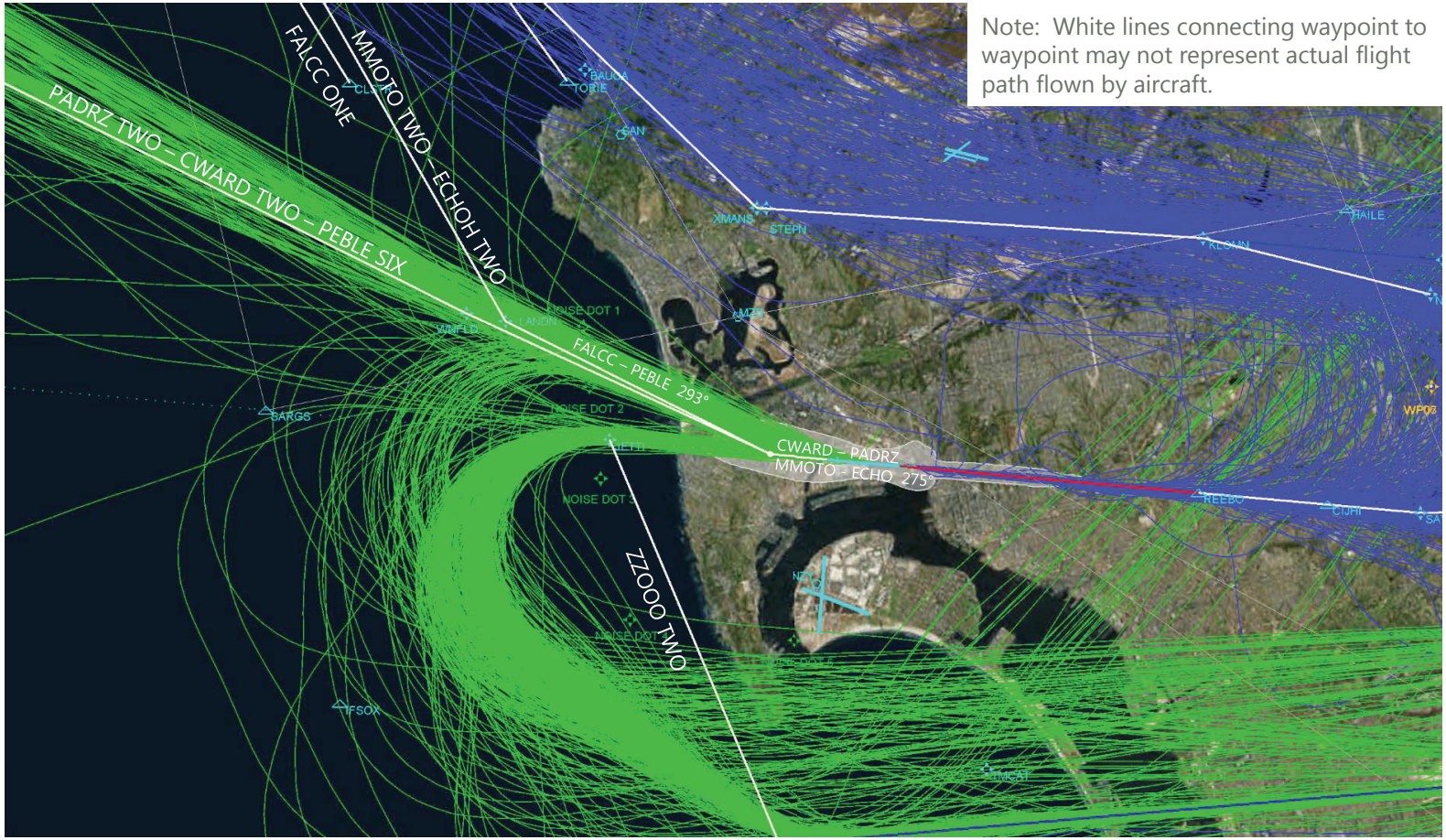
☐ To be studied as part of the FAR Part 150 Study

1. Move the WNFLD and LANDN waypoints south so as to align with the relocated Noise Dot #1 at 290° (15° separation from JETTI at 275°) and designate as "Flyover" waypoints in their respective SID's, consistent with JETTI.
2. Establish within the PADRZ SID procedure a horizontal distance from end of runway (1.0 miles) along a fixed heading which must be satisfied along with altitude before a right turn can be initiated to preclude flights that quickly attain the current 520' altitude and turn right of and prior to Noise Dot #1 before correcting to WYNFLD which results in aircraft flying farther north over Mission Beach.
3. PADRZ ONE SID As currently designed the PADRZ ONE departure leaves aircraft very close to and almost paralleling the coast along La Jolla, increasing noise impacts significantly. We recommend moving the WNFLD and KERNL waypoints 1.5NM south of their current positions. This will ensure aircraft proceed more directly off the coast without paralleling the shore and adds less than a mile of track distance to PADRZ.
4. Create a new procedure: BROCK-1 (alternative 1) Request FAA to revise PADRZ SID and establish new waypoint BROCK1. Adds min increased flight time and takes aircraft further offshore before turning to northern destinations. This will help all coastal neighborhoods with noise issues.
5. Create a new procedure: BROCK-2 (alternative 2 - preferred) Relocate Waypoints WNFLD and LANDN 0.75 miles directly south or adopt BROCK recommendation. Maintain 274 Departure until Altitude 520 or greater. Maintain 274 departure heading until 520 foot altitude or greater and the aircraft have reached (new) flyover waypoint 0.25 to 0.5 miles from the end of the runway before turning towards WNFLD, LANDN or new BROCK Waypoint.
6. Do not move the PADRZ SID further south to avoid negative noise impacts on the south side communities of the Point Loma Peninsula.

Source: ANAC Subcommittee Recommendations (ANAC Approval), October 25, 2017

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Existing Flight Tracks



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

DRAFT Deliberative Document – For Discussion Purposes Only

Updated Slide

ANAC Noise Recommendation 14 – Initial Review

1. *Move LNDN and WNFLD waypoint south in line with Dot #2*:
   - The magnetic heading from the departure end of Runway 27 to Dot #2 is 287°, which is 12° from 275° heading. Moving LNDN and WNFLD waypoints south over Dot #2 would reduce the divergent angle below the required 15°. FAA Order 7110.65X allows for 10° divergence if both SIDS are RNAV, but would change initial runway heading and should be evaluated in the FAR Part 150 Study Update.
   - Not feasible due to reduction in current divergent heading departure throughput capability. May be feasible if initial course from runway end is based on 10° divergence (285° heading). Change to initial heading design should be evaluated in FAR Part 150 Study
2. *Establish within the PADRZ SID procedure a horizontal distance from end of runway (1.0 NM miles) along a fixed heading which must be satisfied along with altitude before a right turn*: Change to initial heading design would be evaluated in FAR Part 150 Study
3. *Move WNFLD and KERNL waypoints 1.5 NM miles south of current location*:
   - If aircraft turn more westerly prior to reaching WNFLD, the divergence angle is no longer 15° ; therefore, the procedure must ensure aircraft heading south and north are laterally separated by 3 NM (note: FAA ATC applies an additional buffer between 0.5 to 1 NM to the 3 NM requirement)
   - Assuming existing initial heading design, the earliest opportunity to turn west is north and east of WNFLD waypoint to ensure separation between ZZOOO SID and BORDER 7 SID
   - Assuming a 10 degree divergent heading, WNFLD location may move south of existing location.

DRAFT Deliberative Document – For Discussion Purposes Only

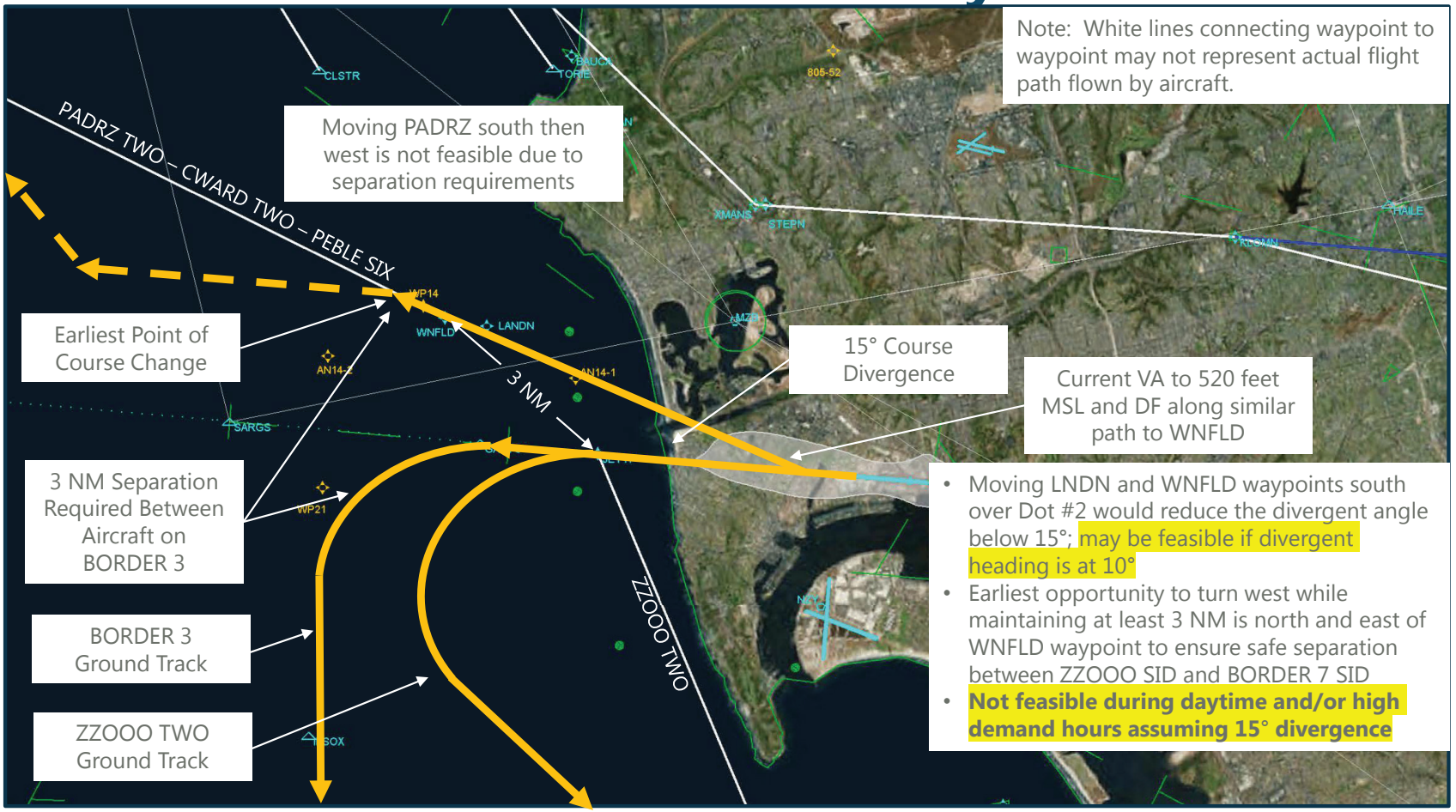
ANAC Noise Recommendation 14 – Initial Review (cont'd)

5. *Create BROCK-1 procedure*: Is not feasible during daytime hours for same reasons as #3 above, but a procedure similar to the BROCK recommendations for nighttime operations after 10:00 pm when all traffic is on a 290° heading (existing VA to DF coding) is feasible (see ANAC 14 Alternatives 1, 2 and 3)
6. *Create BROCK-2 procedure*: See No. #4 above

DRAFT Deliberative Document – For Discussion Purposes Only

Updated Slide

ANAC Noise Recommendation 14 – Day Time Issues



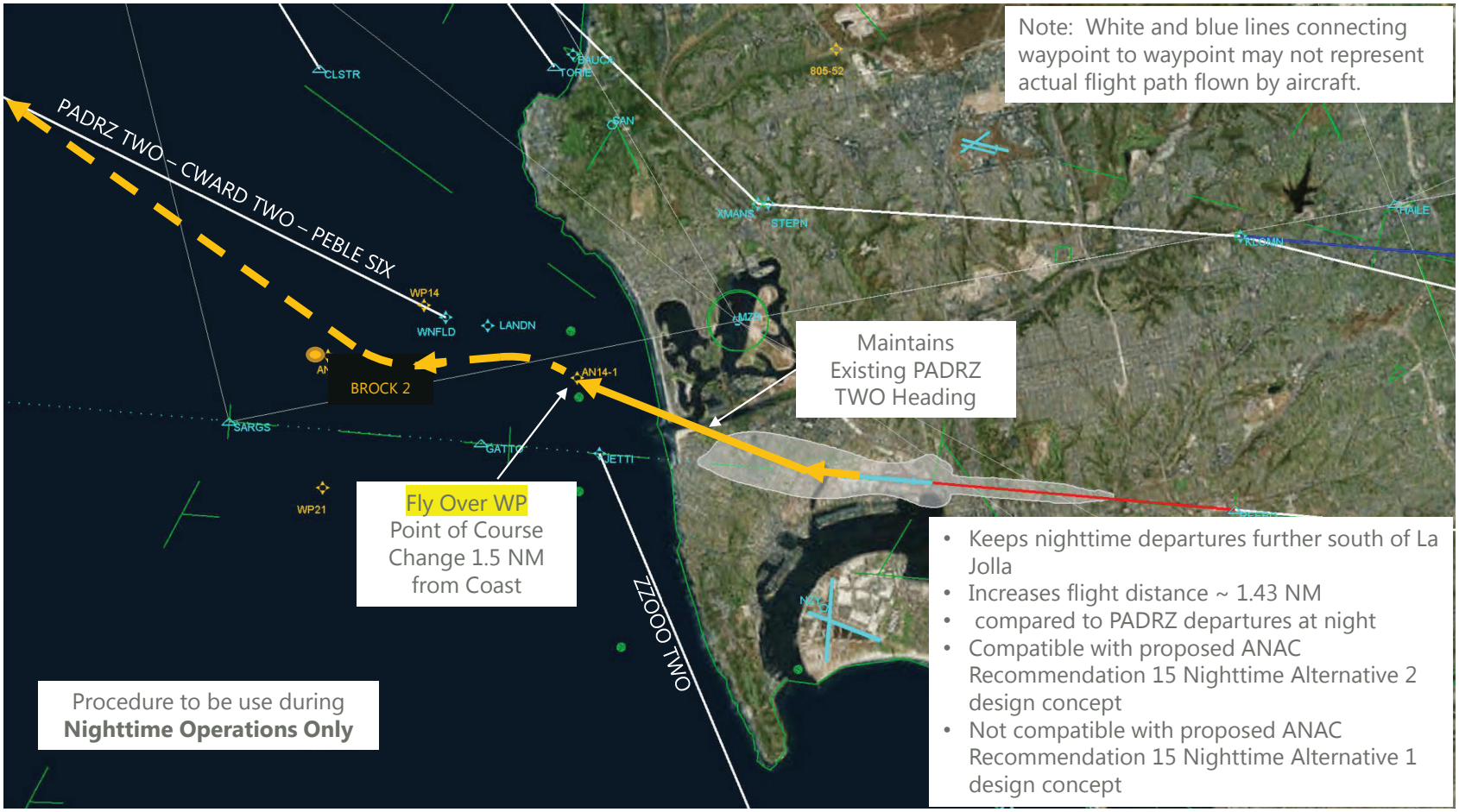
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Nighttime Alternatives

- Alternative 1 - Turn at 1.5 NM from shoreline
  - Maintains existing initial departure design (VA to DF leg coding)
  - Consistent with FAA Dot agreement
  - Projected flight track on initial heading is consistent with current flight tracks
- Alternative 2 – Turn at shoreline
  - Maintains initial departure design (VA to DF leg coding)
  - Turn location prior to Noise Dot agreement
  - Projected flight track on initial heading is consistent with current flight tracks
- Alternative 3 – Turn at earliest point possible
  - Maintains existing initial departure design
  - Turn occurs where existing design (VA to DF leg coding) heading intersects the DNL 65 contour
  - Turn location prior to FAA Dot agreement
  - Projected flight track on initial heading strays from current flight tracks to the south (potential for change in DNL 65 area)
- All Alternatives not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

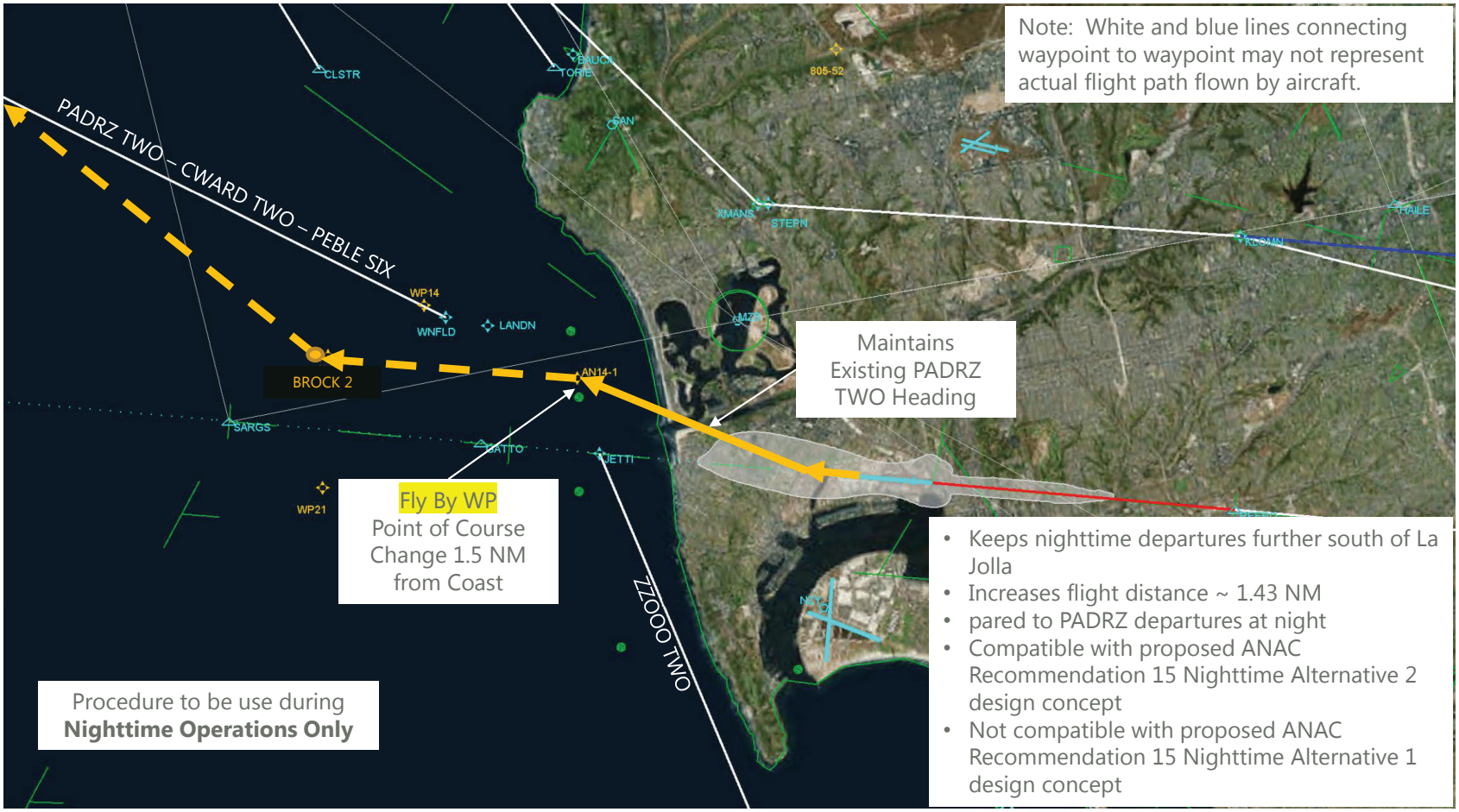
New Slide Not Show in TAC Briefing

ANAC Noise Recommendation 14 – Alt 1 Turn at 1.5 NM



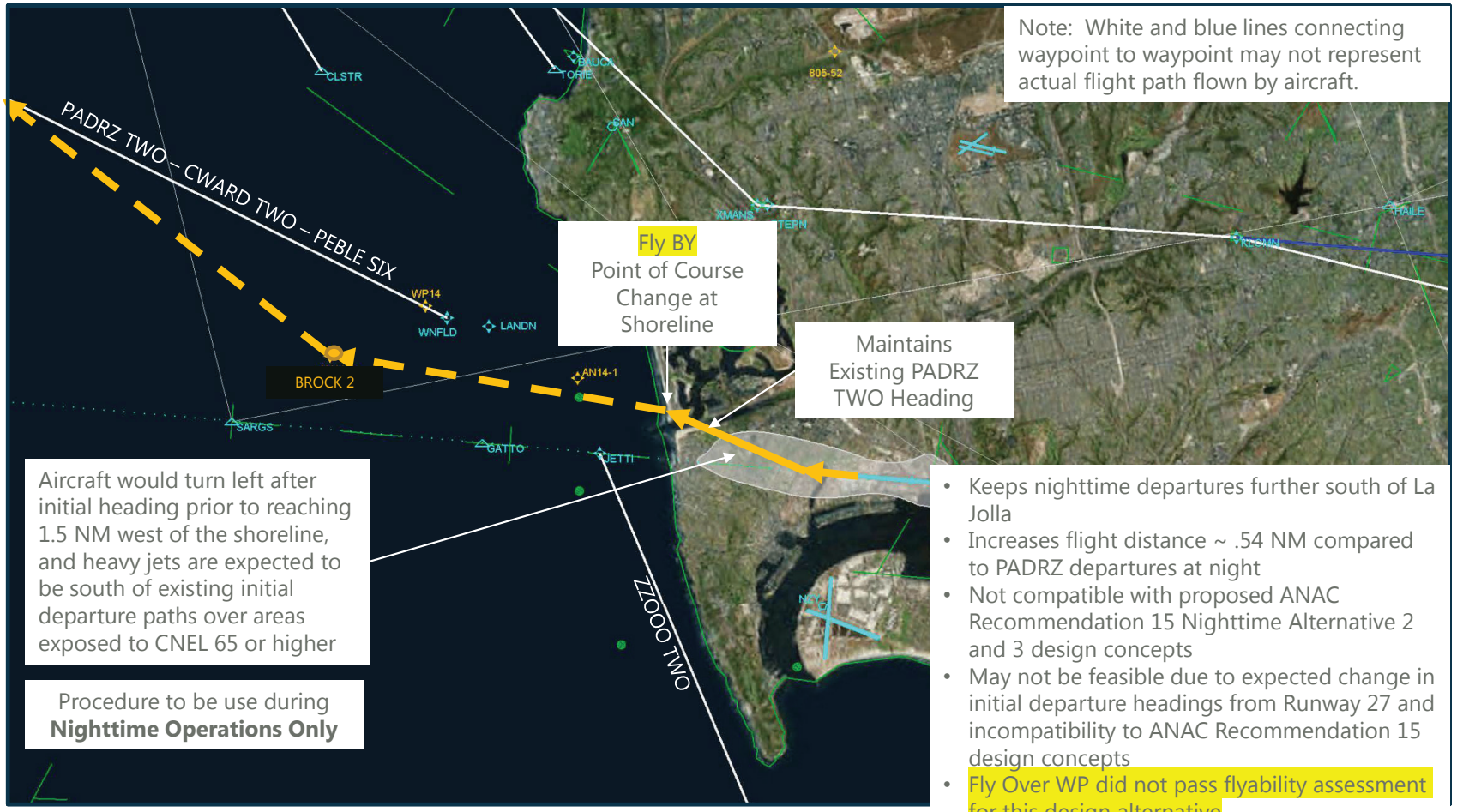
Updated Slide

ANAC Noise Recommendation 14 – Alt 1 Turn at 1.5 NM



Updated Slide

ANAC Noise Recommendation 14 – Alt 2 Turn at Shoreline



- Keeps nighttime departures further south of La Jolla
- Increases flight distance ~ .54 NM compared to PADRZ departures at night
- Not compatible with proposed ANAC Recommendation 15 Nighttime Alternative 2 and 3 design concepts
- May not be feasible due to expected change in initial departure headings from Runway 27 and incompatibility to ANAC Recommendation 15 design concepts
- Fly Over WP did not pass flyability assessment for this design alternative

Updated Slide

ANAC Noise Recommendation 14 – Alt 3 Turn at DNL 65

New Slide Not Show in TAC Briefing

ANAC Noise Recommendation 14 – TAC Input Summary

- Initial heading:
  - Application of 10° divergent heading
  - Cross Mission Beach as far south as possible
  - Runway heading until 1 NM then turn on 290° heading
  - Not consistent with nighttime noise abatement heading
- Daytime
  - Application of 10° divergent heading
  - Move BORDER SID south so WNFLD can move south and still maintain 3 NM separation
- Alternative 1, 2 and 3
  - Prefer turn to west/northwest as close to shoreline as possible.
  - Preferences related to Fly Over or Fly By waypoint when aircraft turn west/northwest.
  - Alternative 1 and 2 provides flight crews ample time to fly a steady course after takeoff.
  - Alternative 3 is not viable option due to FMS performance issues
  - Do not mitigate nighttime noise for Mission Beach
- "Conflicts" with other sub-committee recommendations need to be resolved.

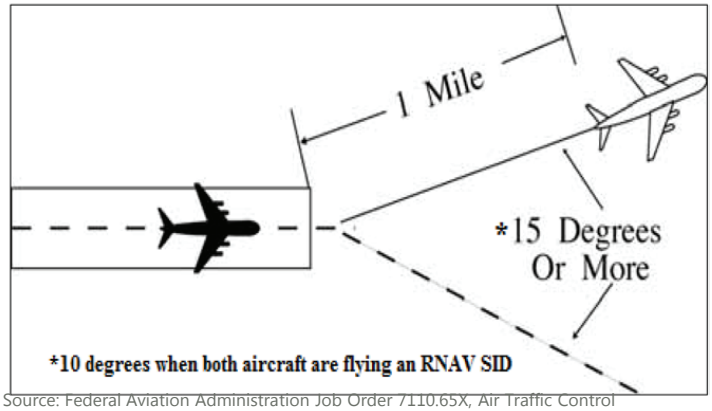
New Slide Not Show in TAC Briefing

Equivalent Lateral Separation Operation (ELSO)

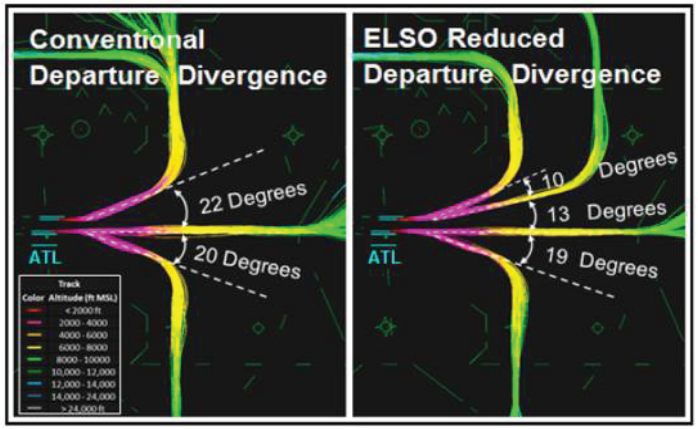
- NextGen enabled technology allowing reduced separation requirement from 15° to 10 ° for aircraft using PBN SIDs
- FAA Order 7110.65X, Change 1 – Air Traffic Control
  - Paragraph 5-8-1 (a) Provides criteria for simultaneous parallel and single runway operations allowing a minimum of 10° separation for aircraft operating on GPS PBN SID
- FAA JO 7210.3AA Change 1 - Facility Operation and Administration
  - Paragraph 10-3-15 – Equivalent Lateral Spacing Operations
- Currently implemented in ATL for simultaneous parallel operations
- Possible future implementations:
  - CLE, DEN, DET, FLL, MIA

FIG 5–8–1

Successive Departures



Source: Federal Aviation Administration Job Order 7110.65X, Air Traffic Control



Source: Federal Aviation Administration Webpage 2015

New Slide Not Show in TAC Briefing

Application at SAN

- Application of criteria is feasible
- Will change flight pattern over areas exposed to CNEL 65 or greater and is one to two possible initial departure heading concepts for Runway 27
- Implementation at ATL suggests separation may begin at VA/DF or VA/CF turn point versus waypoints separated 10° from runway end - further local FAA coordination will be required as part of the alternative procedure design
- Local facility may require a buffer or slightly wider angle then 10° (e.g. 12°)
- All existing SIDs from Runway 27 to north/northwest would need to be redesigned to ensure consistency in initial departure operation
- Facilities Management Considerations (outlined in JO 7210.3AA)
  - Training
  - Letters of Agreement
  - Video maps showing departure tracks

ANAC Noise Recommendation 15 – Reduce Noise Over the Point Loma Peninsula and La Jolla

DRAFT Deliberative Document – For Discussion Purposes Only

Updated Slide

ANAC Noise Recommendation 15

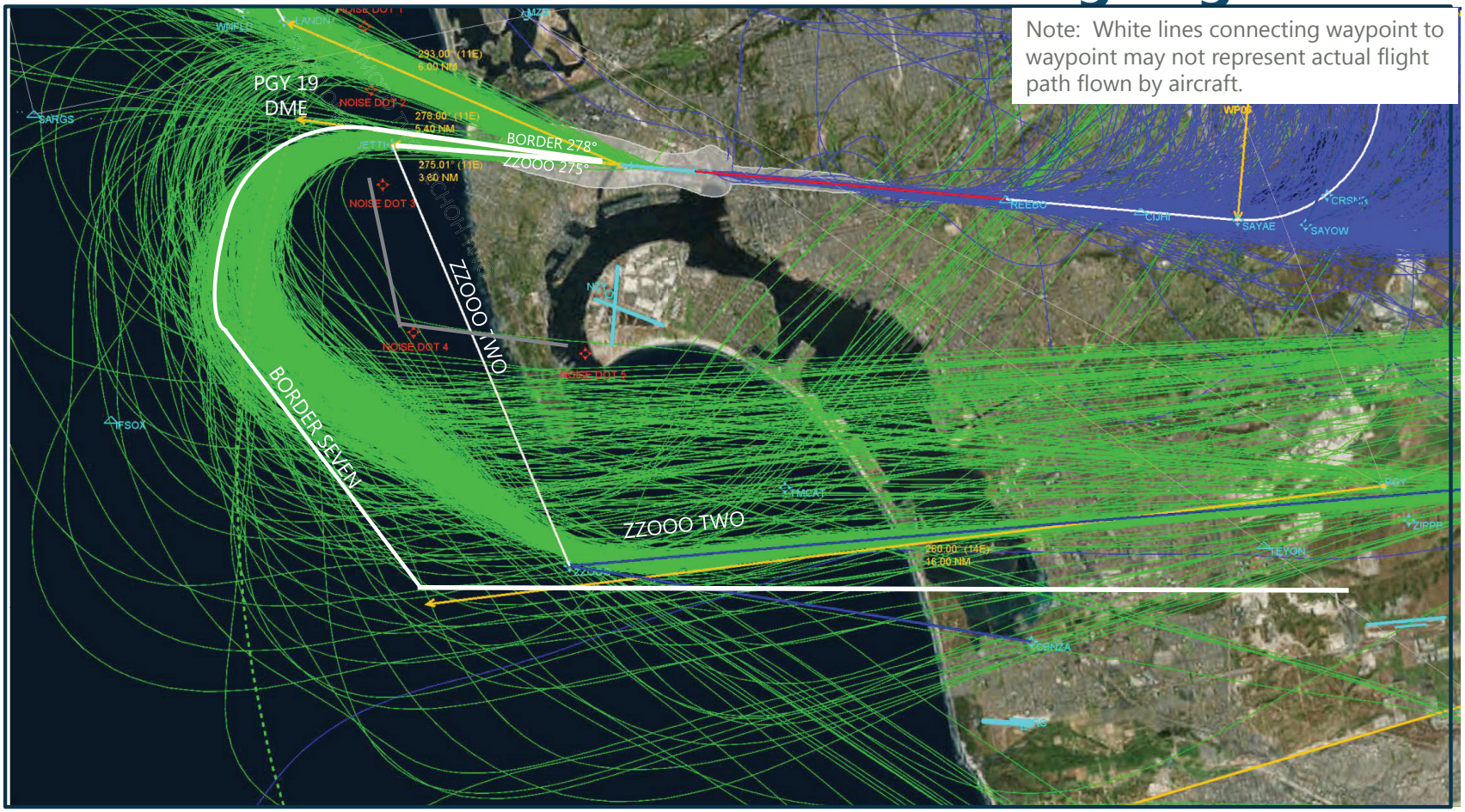
Revise ZZOOO to significantly reduce or eliminate flights over the Point Loma Peninsula, including Cabrillo National Park and reduce or eliminate eastbound turns over La Jolla. To be studied as part of the FAR Part 150 Study

1. East bound flights should reach a minimum of 8K feet before crossing over ZZOOO to minimize thrusters and reduce duration of noise impacts over Point Loma.
2. FAA\TRACON to discourage the practice of redirecting flights off of their filed ZZOOO flight plan departure, to turn north then east over La Jolla. FAA to increase minimum SID flyover\flyby altitudes to encourage increased climb rates.
3. FAA\TRACON to direct that ALL SAN departure separation be limited to between JETTI (275°) and the historical Red Noise Dot #1 (290° vectors from the end of runway 27) for LNSAY, BORDER, PEBLE and ZZOOO, etc. (plus all new Metroplex SID's); Prohibit 250° to 275° departure vector range, except for specific safety events ("Runway 27 STAR Missed Approach Wave Off").
4. Follow ZZOOO procedure, comply with the JETTI flyover waypoint and consider the establishment of a minimum vectoring altitude for Eastbound turns.
5. The ZZOOO ONE departure as currently designed puts departing aircraft to close to the Point Loma peninsula and the southern end of coastal La Jolla, subjecting residents to increased and at times incessant noise from departing aircraft. Aircraft need to be further offshore before beginning the turn south to the ZZOOO waypoint. We recommend replacing the JETTI waypoint with a waypoint along the same track from the departure end of runway 27 that is 2 NM further west, located at approximately 32.75360N -117.25755W.

Source: ANAC Subcommittee Recommendations (ANAC Approval), October 25, 2017

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Existing Flight Tracks



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

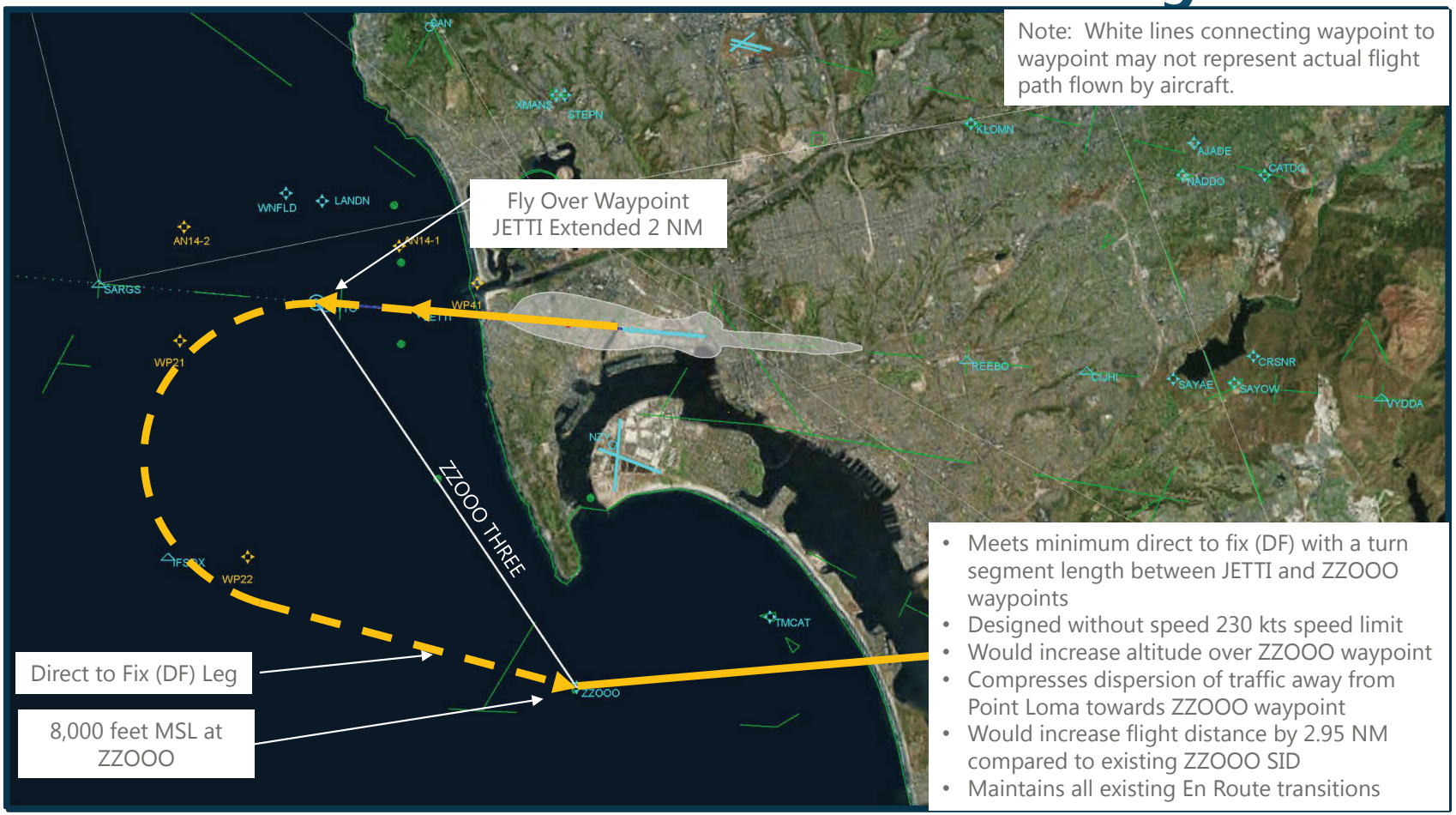
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Initial Review

1. *East bound flights should reach a minimum of 8,000 feet MSL before crossing over ZZOOO*: A requirement of 8,000 feet MSL at ZZOOO waypoint is not feasible based on existing design of procedure, but may be possible if existing procedure design is modified (see ANAC 15 Alternative 1).
2. *Redirecting flights off of their filed ZZOOO flight plan departure, to turn north then east over La Jolla*: If an RNAV SID is implemented for eastbound departures on a directed 290° heading and thence directed towards ZZOOO waypoint, it would decrease frequency of traffic vectored north then east over La Jolla (ANAC 15 Alternatives 2 and 3 addresses this issue).
3. *Direct that ALL SAN departure separation be limited to between JETTI (275° heading) and the historical Red Noise Dot #1 (290° vectors from the end of Runway 27)*: Initial or directed heading at departure to be addressed in FAR Part 150 Study.
4. *Comply with the JETTI flyover waypoint and consider the establishment of a minimum vectoring altitude for Eastbound turns*: ZZOOO SID complies with recommendation for flight paths within 275° heading. ZZOOO SID is an RNAV procedure and has no minimum vectoring altitudes (MVA). MVA is driven by obstacle clearance. If the intent is to raise the altitude on specific segments, MVA is not a feasible method.
5. *Aircraft need to be further offshore before beginning the turn south to the ZZOOO waypoint*: Increasing distance from Point Loma shoreline as aircraft turn back to the east would require a modification to ZZOOO SID design (see ANAC 15 Alternative 1). Moving the JETTI waypoint further west is intended to raise altitude over ZZOOO and increase distance from the Point Loma shoreline (see ANAC 15 Alternative 1).

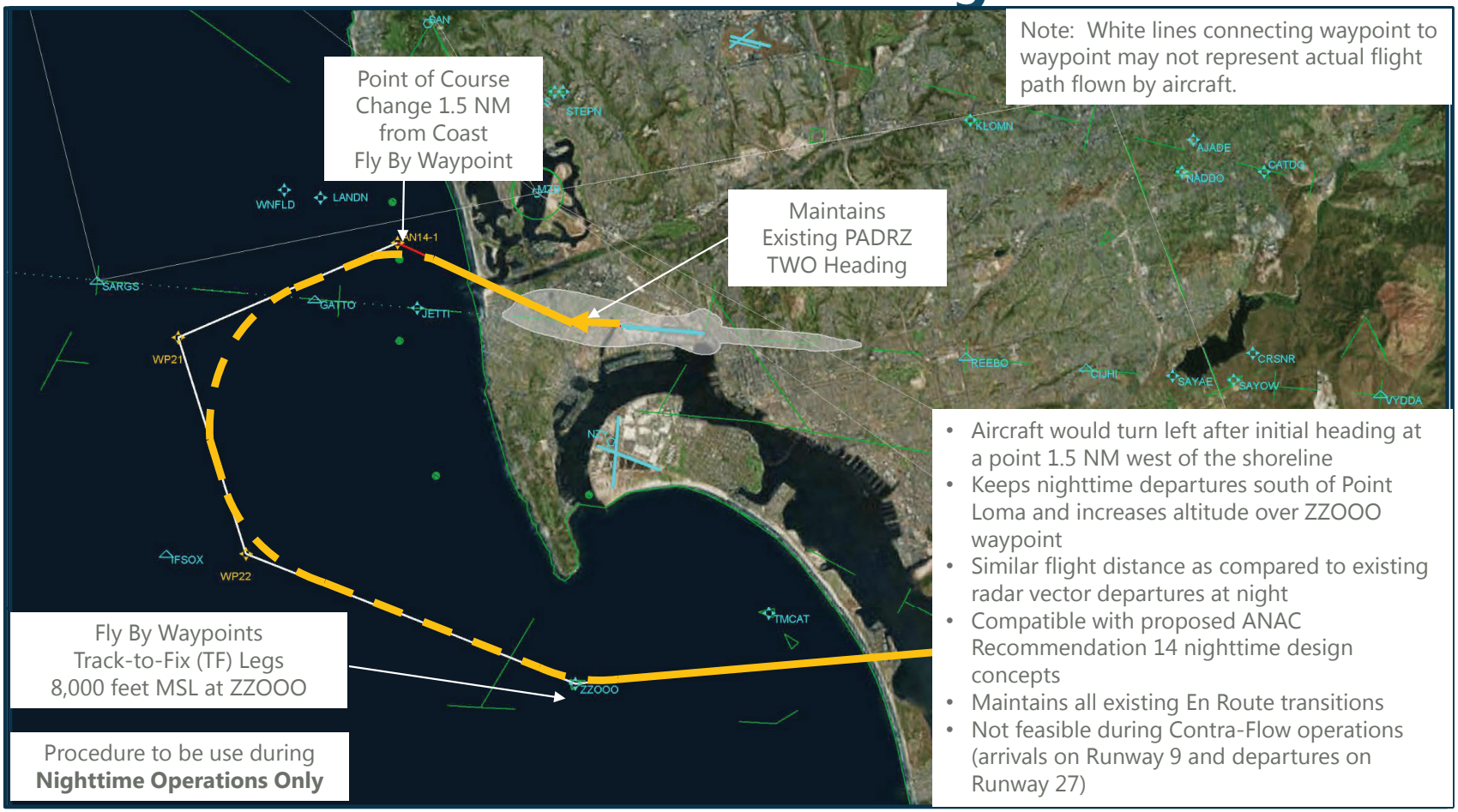
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Alt 1 Design



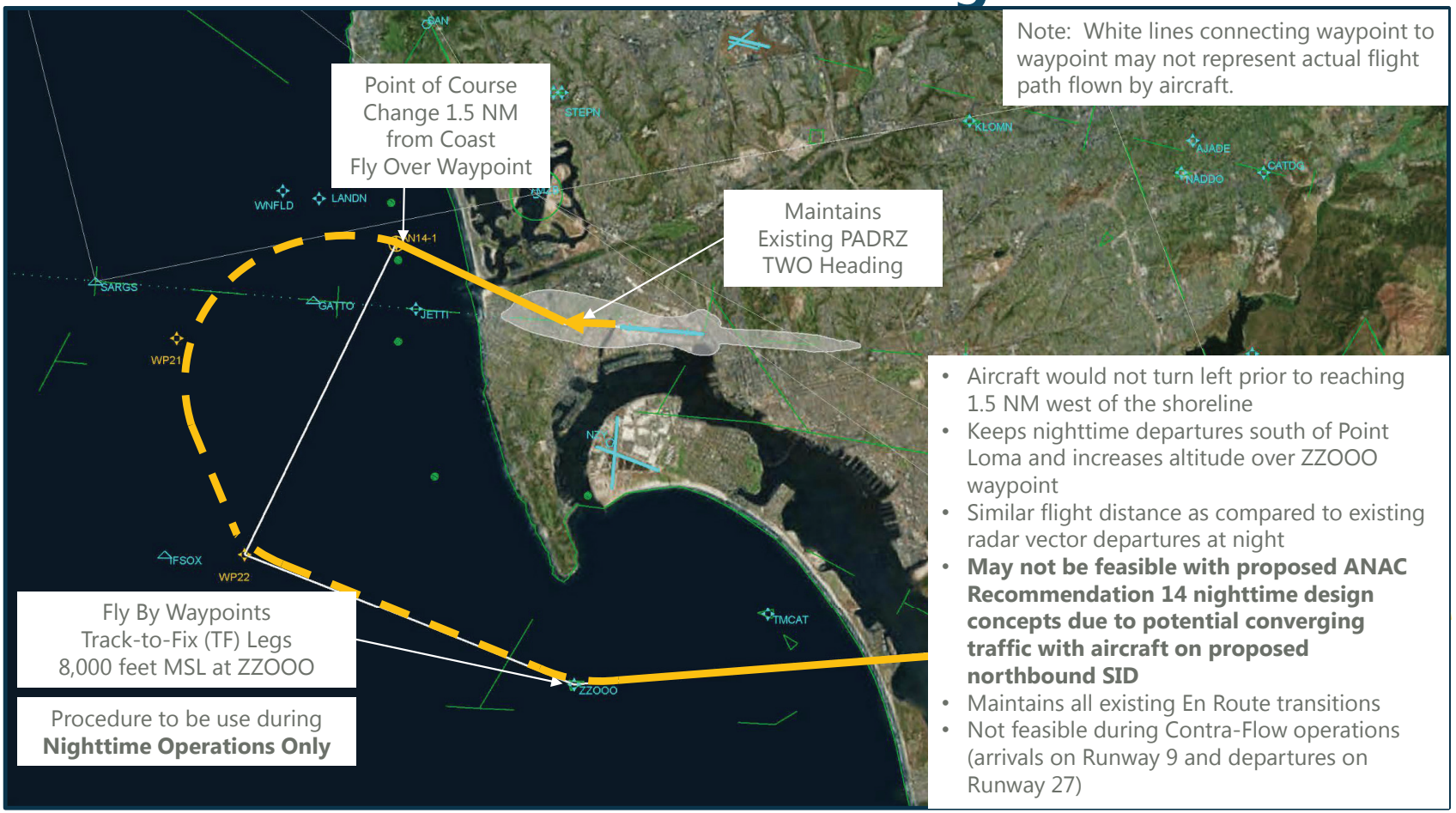
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Night Alt 2



- Aircraft would turn left after initial heading at a point 1.5 NM west of the shoreline
- Keeps nighttime departures south of Point Loma and increases altitude over ZZOOO waypoint
- Similar flight distance as compared to existing radar vector departures at night
- Compatible with proposed ANAC Recommendation 14 nighttime design concepts
- Maintains all existing En Route transitions
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

ANAC Noise Recommendation 15 – Night Alt 3



- Aircraft would not turn left prior to reaching 1.5 NM west of the shoreline
- Keeps nighttime departures south of Point Loma and increases altitude over ZZOOO waypoint
- Similar flight distance as compared to existing radar vector departures at night
- **May not be feasible with proposed ANAC Recommendation 14 nighttime design concepts due to potential converging traffic with aircraft on proposed northbound SID**
- Maintains all existing En Route transitions
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

New Slide Not Show in TAC Briefing

ANAC Noise Recommendation 15 – TAC Input Summary

- Alternative 1
  - Moving JETTI further west may not result in an altitude increase if 230kt restriction is removed.
  - Turn radius following JETTI will vary more as compared today if 230kt speed restriction is eliminated
  - What is expected benefit of having aircraft at or above 8,000 feet MSL near ZZOOO waypoint?
  - Can this be considered a nighttime alternative as well to help mitigate nighttime noise over Mission Beach?
- Night Alternative 2
  - Provides a more consistent flight track
  - Does not help mitigate noise over Mission Beach
- Night Alternative 3
  - Turn radius following JETTI will vary more as compared today if 230kt speed restriction is eliminated
  - Prefer fly-over waypoint design (Point Loma representative)
- CAC: Alternative 1 - Can this design be considered as a nighttime departure procedure over Pt. Loma?
- CAC: Alternative 2 – This does not help mitigate noise over Mission Beach

ANAC Noise Recommendation 16 – Reduce Arrival Noise Over La Jolla and East County Communities

Updated Slide

ANAC Noise Recommendation 16

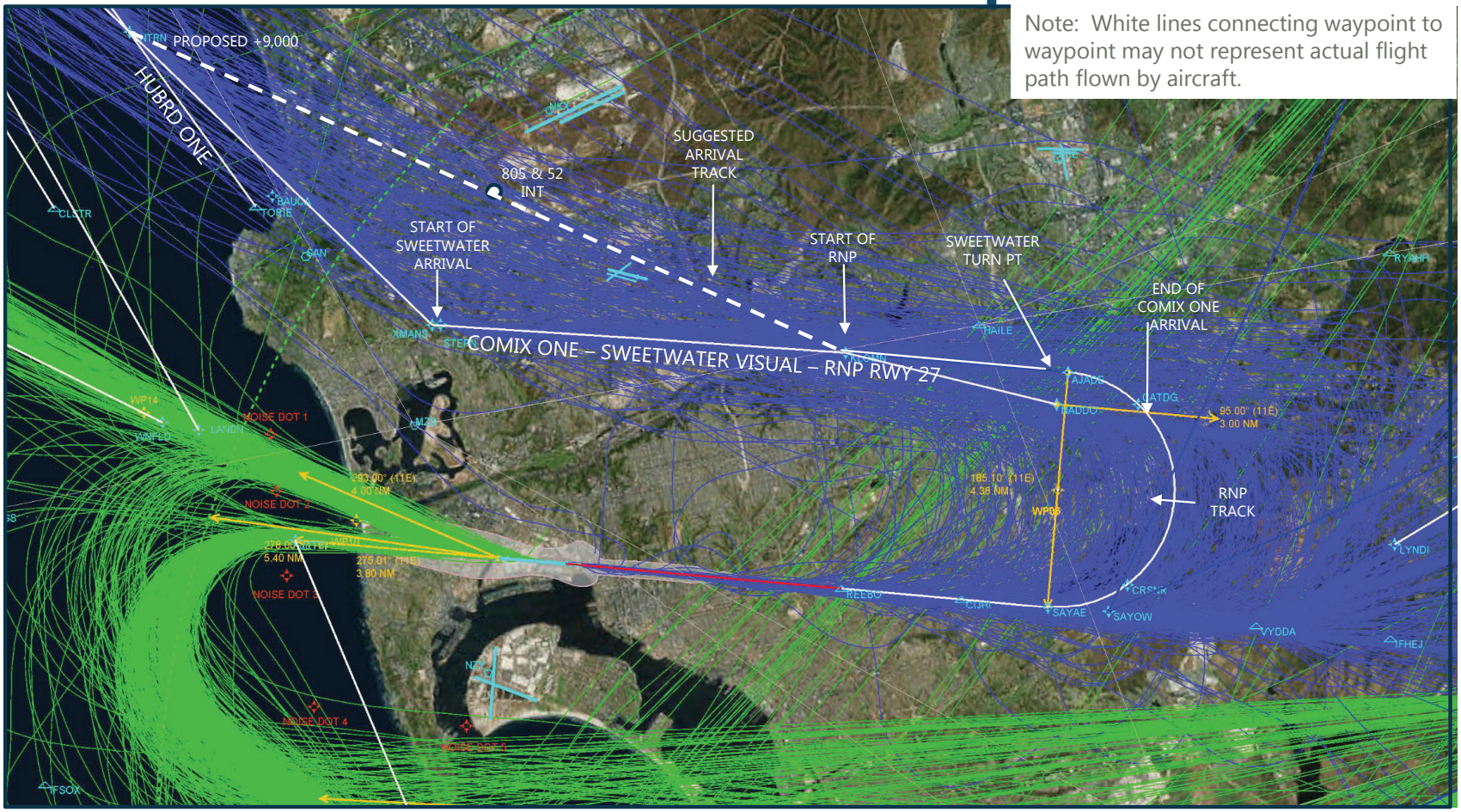
Reassess and revise the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the North in a very narrow corridor.

1. Revise COMIX STAR procedure in order to shift flights that Metroplex has moved and concentrated farther South (the downwind leg) over less populated areas and restore prior altitude.
2. Shift the way point XMANS on the COMIX STAR north to a location that is over the interstate freeway 805 and 52 with the constraint to remain clear of MCAS Miramar's airspace. It would come ashore over Torrey Pines State Park before connecting with KLOMN.
3. Increase Min. Altitude at LNTRN (LCOVE) at or above 10,000. This change would result in aircraft flying over less populated areas, including industrial businesses, thus reducing the noise impact and saving time/fuel. This proposed path is closer to the historical flight tracks pre-NextGen.
4. COMIX ONE STAR: The RNAV-only COMIX ONE arrival is very similar to the existing non-RNAV BAYVU arrival in terms of ground track with a key difference being that the COMIX arrival has an "at or above 8,000 feet" altitude restriction on its last offshore waypoint (LANTRN). The BAYVU arrival has an "at or above 9,000 feet" restriction at its nearly identically-located LCOVE waypoint. This has resulted in aircraft being lower and noisier over La Jolla. We recommend changing the LANTRN waypoint's altitude restriction to "at or above 9,000 feet".

Source: ANAC Subcommittee Recommendations (ANAC Approval), October 25, 2017

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 16 - Graphic



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Updated Slide

ANAC Noise Recommendation 16 – Initial Review

1. *Revise COMIX STAR procedure in order to shift flights over less populated areas and restore prior altitude*: Leg between KLOMN waypoint to NADDO waypoint was designed to prevent Class B airspace excursions. This leg cannot be changed until the Class B redesign is complete. Path may be modified post Class B design.
2. *Shift the way point XMANS on the COMIX STAR north to a location that is over the interstate freeway 805 and 52*: Crossing the shoreline over Torey Pines State Park and heading to XMAN waypoint shifted north over I-805 and SR-52 would reduce the flight track 1 NM (see ANAC Recommendation 16 Alternative 1 and 2)
   - Reduction in vectoring and sequencing area may be deemed infeasible by FAA
   - Possible ATC issues with Miramar Marine Corps Air Station
   - Moving noise from one community to another is contrary to FAA policy, and may be deemed infeasible by FAA – aircraft overflight location moved over another community and aircraft are lower in altitude
3. *Increase Min. Altitude at LNTRN (LCOVE) at or above 10,000*: Increasing LNTRN to 10,000 feet MSL is not feasible based on current design
   - Increasing to 10,000 feet MSL would exceed the descent gradient criteria (maximum of 330 feet per NM) from LNTRN to KLOMN waypoint at 6,000 feet MSL along the existing COMIX path.
   - Increasing altitude at LNTRN to 10,000 feet MSL along route shifted north would also exceed descent gradient criteria.

SEE NEXT SLIDE FOR UPDATED SUMMARY

DRAFT Deliberative Document – For Discussion Purposes Only

Updated Slide

ANAC Noise Recommendation 16 – Initial Review

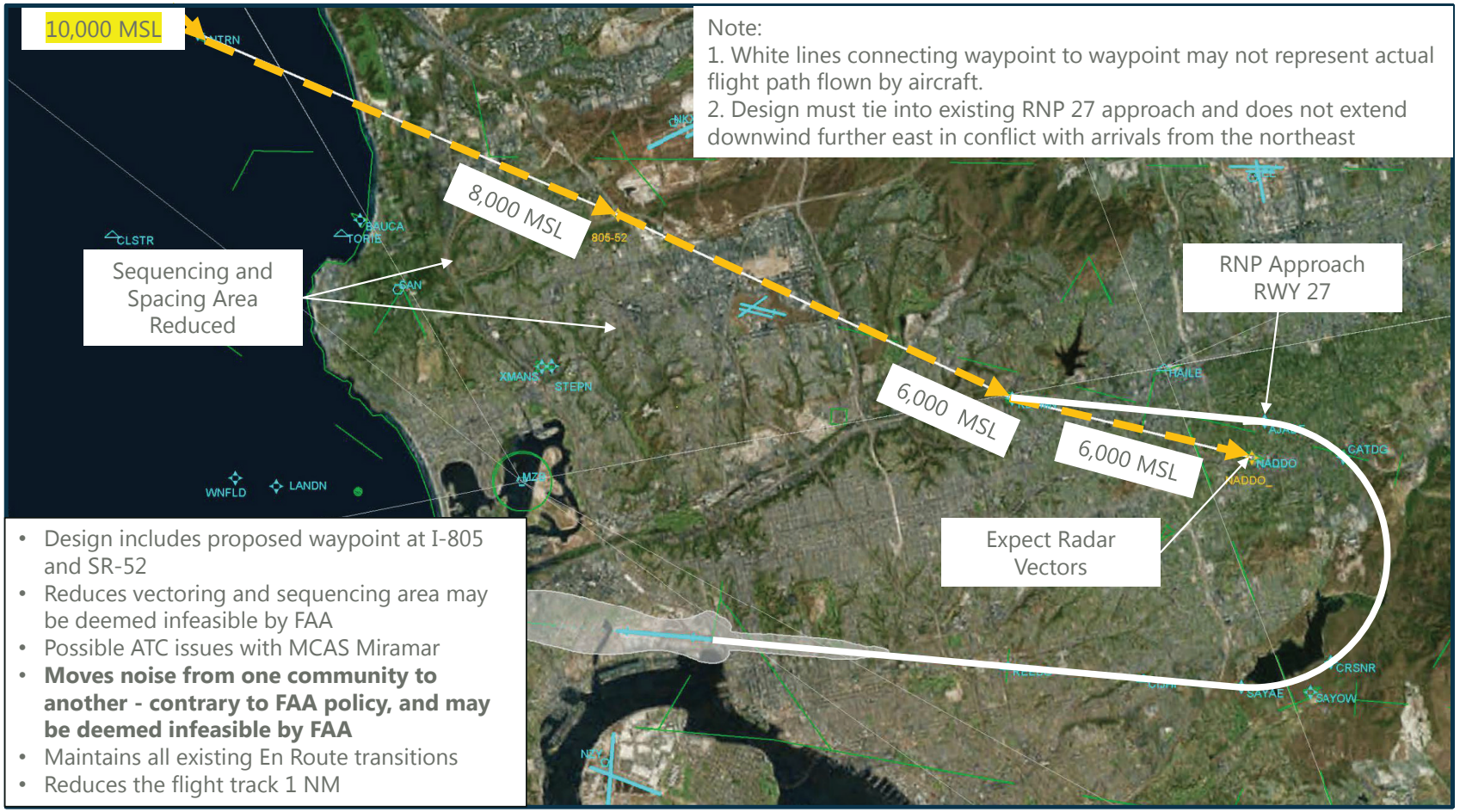
3. *Increase Min. Altitude at LNTRN (LCOVE) at or above 10,000 (Cont.)*
   - Existing COMIX:
     - Changing the altitude to 10,000 feet MSL at LNTRN is not feasible as descent gradients are exceeded from LNTRN (10,000 feet) to XMAN (7,000 feet)
       - (3,000 feet/8NM = 375 feet per NM)
   - Alternatives 1 and 2:
     - LNTRN @ 10,000 to 805-52WP @ 7,000 exceeds descent gradient criteria (3,000/7NM = 428 feet per NM)
     - These alternatives can be redesigned to achieve 10,000 feet at LNTRN
     - Coding changes for Alternative 1 include FLSHH and LNTRN to +10,000 feet and 805-52WP to 8,000 feet
     - Coding changes for Alternative 2 include FLSHH and LNTRN to +10,000 feet
     - No analysis on optimization conducted for each revised alternative. FAA TRACON and airline input required
   - North Route:
     - Coding LNTRN to+10,000 and BAUCA to 9,000 meets design criteria
       - Does not pass flyability for low performance aircraft crossing COMIX at 15,000 feet

4. *Change the LANTRN waypoint's altitude restriction to "at or above 9,000 feet": According to FAA information posted on the FAA Instrument Flight Procedure Gateway Production page for SAN, the COMIX TWO STAR is expected raise the altitude from at or above 8,000 to at or above 9,000 feet at the LNTRN waypoint.*

DRAFT Deliberative Document – For Discussion Purposes Only

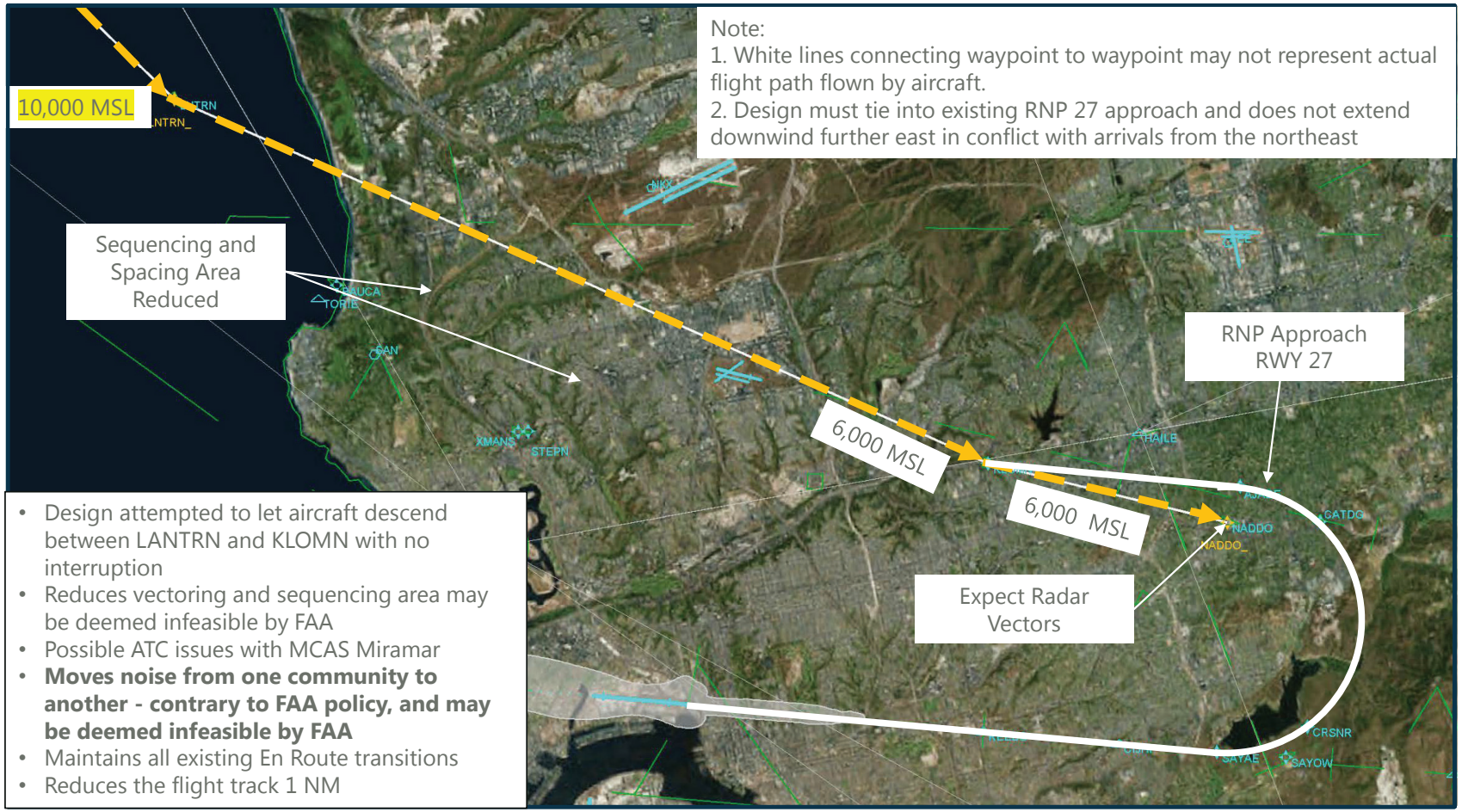
Updated Slide

ANAC Noise Recommendation 16 – Alt 1



Updated Slide

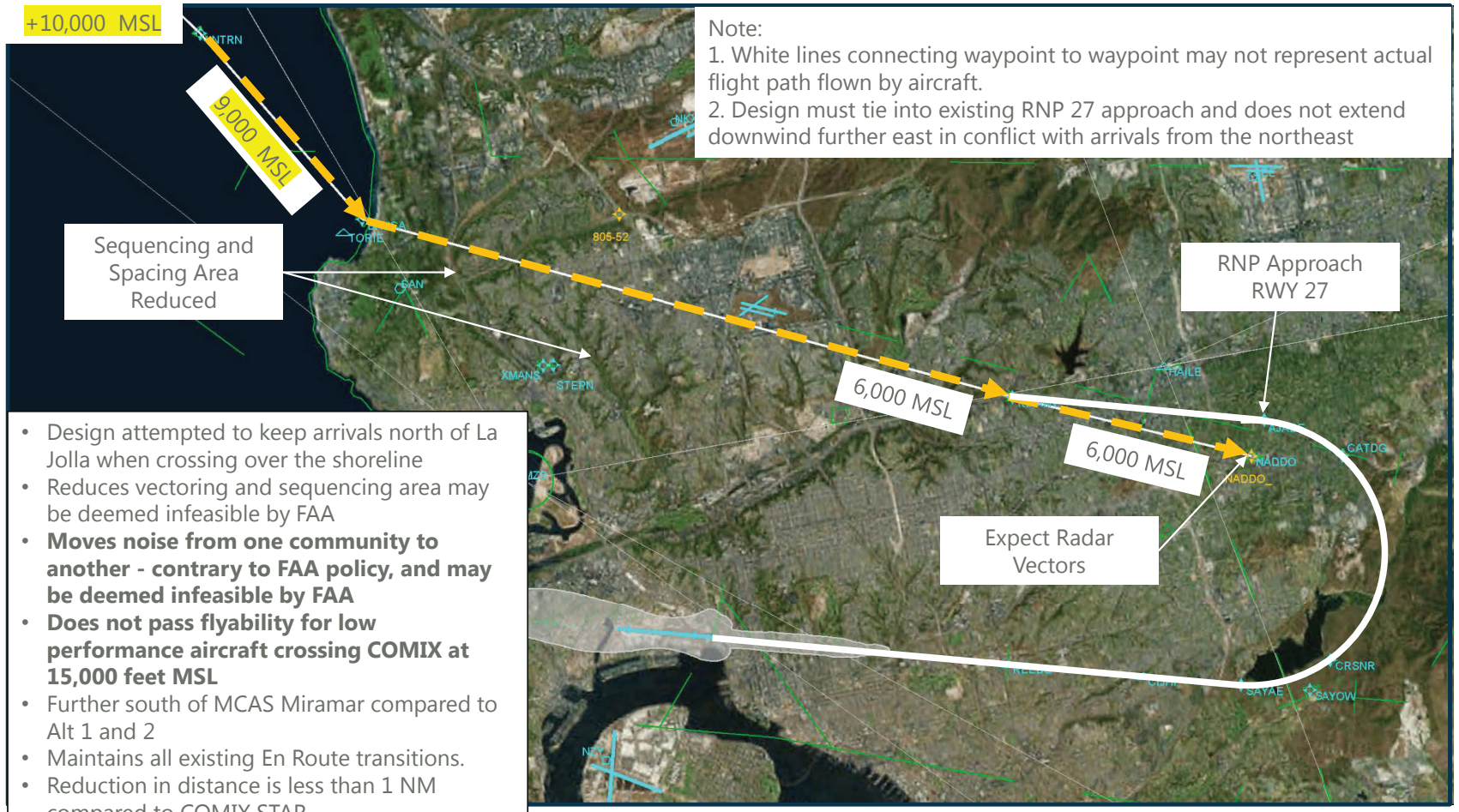
ANAC Noise Recommendation 16 – Alt 2



- Design attempted to let aircraft descend between LANTRN and KLOMN with no interruption
- Reduces vectoring and sequencing area may be deemed infeasible by FAA
- Possible ATC issues with MCAS Miramar
- **Moves noise from one community to another - contrary to FAA policy, and may be deemed infeasible by FAA**
- Maintains all existing En Route transitions
- Reduces the flight track 1 NM

Updated Slide

ANAC Noise Recommendation 16 – Alt 3



- Design attempted to keep arrivals north of La Jolla when crossing over the shoreline
- Reduces vectoring and sequencing area may be deemed infeasible by FAA
- **Moves noise from one community to another - contrary to FAA policy, and may be deemed infeasible by FAA**
- **Does not pass flyability for low performance aircraft crossing COMIX at 15,000 feet MSL**
- Further south of MCAS Miramar compared to Alt 1 and 2
- Maintains all existing En Route transitions.
- Reduction in distance is less than 1 NM compared to COMIX STAR

DRAFT Deliberative Document – For Discussion Purposes Only

New Slide Not Show in TAC Briefing

ANAC Noise Recommendation 16 – TAC Input

- Alternative 1
  - KLOMN at 6,000 feet is difficult to make for the navigation software. Steep descents are not recommended with speed reductions in arrival procedures. This combination could lead some navigation software to reduce speed well before air traffic control would like the aircraft to be at a slower speed.
  - Reference to historic flight tracks related to moving COMIX arrivals north.
  - Based on maximum descent gradient, appears aircraft can be at 10,000 feet over LNTRN and 6,000 feet at KLOMN
  - Suggestion to increase altitude at I-805/SR-53 waypoint
  - Inquired about timing of Class B airspace change
  - Alternative 1 is preferred to meet Recommendation 16 intent
- Alternative 2
  - KLOMN at 6,000 feet is difficult to make for the navigation software. Steep descents are not recommended with speed reductions in arrival procedures. This combination could lead some navigation software to reduce speed well before air traffic control would like the aircraft to be at a slower speed.
  - Reference to historic flight tracks related to moving COMIX arrivals north.

New Slide Not Show in TAC Briefing

ANAC Noise Recommendation 16 – TAC Input (cont'd)

- Alternative 3
  - KLOMN at 6,000 feet is difficult to make for the navigation software. Steep descents are not recommended with speed reductions in arrival procedures. This combination could lead some navigation software to reduce speed well before air traffic control would like the aircraft to be at a slower speed.
  - Not preferred due to lower altitude crossing coastline, worse impact on La Jolla, and does not meet recommendation.

Concept Designs - Process Considerations

- Assumes proposed concepts make it through first two steps in FAA process
- Shorter duration in FAA process
  - Concepts that maintain initial departure runway headings
  - Noise screening may be adequate to determine potential noise impacts
  - No significant changes to noise for areas exposed to CNEL 65 or higher and/or reportable increases for areas exposed to levels between CNEL 45 and 65 – high likelihood FAA will conduct a categorical exclusion
- Longer duration in FAA process
  - Concepts that change initial departure runway headings
  - Cumulative aircraft noise analysis required to assess potential significant impacts
  - Potential for significant changes to noise for areas exposed to CNEL 65 or higher and/or reportable increases for areas exposed to levels between CNEL 45 and 65 – high likelihood FAA will require an Environmental Assessment or documented categorical exclusion with extensive community involvement outreach.

Next Steps – Action Items and Next CAC Meeting

DRAFT Deliberative Document – For Discussion Purposes Only

Next Steps

- Input period open until August 2nd
- Summarize and address comments
- Update viable alternatives
- Present updates and feasibility recommendations at August 30th TAC and CAC meetings

B.1.5 CAC AND TAC MEETING #3 – AUGUST 30, 2018

RICONDO®

San Diego County Regional Airport Authority (SDCRAA)
Flight Procedure Evaluation
Technical Advisory Committee and Citizen Advisory Committee Meeting #3

San Diego International Airport

August 30, 2018

DRAFT Deliberative Document – For Discussion Purposes Only

DRAFT Deliberative Document – For Discussion Purposes Only

Agenda

- Meeting Goals
- Design Parameters
- Acronyms
- ANAC Recommendation 14 Design Concepts
- ANAC Recommendation 15 Design Concepts
- ANAC Recommendation 16 Design Concepts
- East County SDIA Arrivals from Northwest
- Next Steps

DRAFT Deliberative Document – For Discussion Purposes Only

Meeting Goals

- Review design concept recommendations
- Review new draft concepts as result of preliminary draft concept discussions/input
- Gather input from Technical Advisory Committee (TAC) and Citizen Advisory Committee (CAC) on consultant team recommendations and refinements to design concepts

DRAFT Deliberative Document – For Discussion Purposes Only

Design Parameters

- Be sensitive to aircraft flight path changes over areas exposed to CNEL 65 or higher
- Do not impact safety
- Meet FAA design criteria
- Fit within existing airspace and maintain existing airspace hand-off areas
- Do not impact capacity of SDIA
- Do not move noise to new non-compatible areas

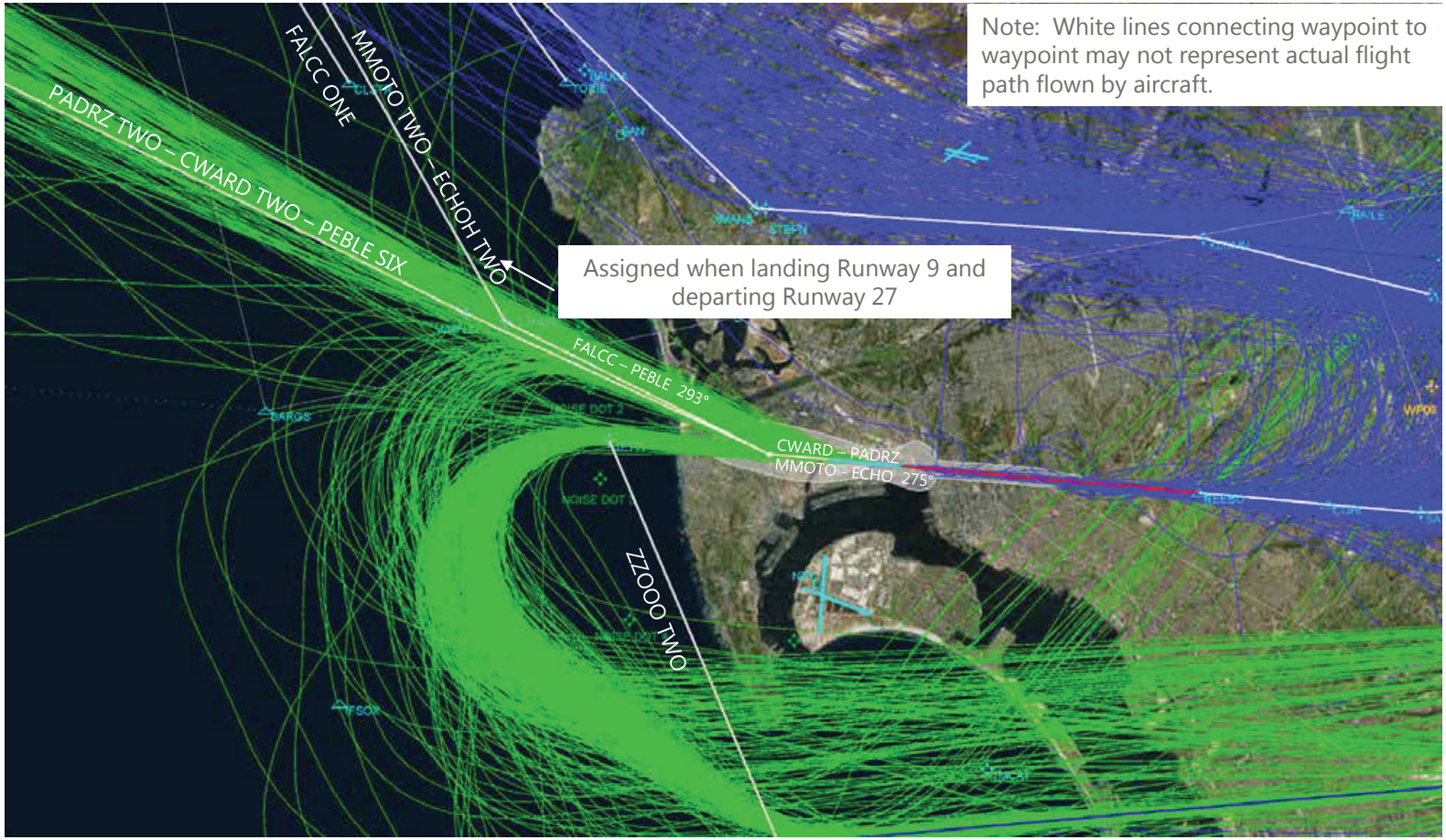
Acronyms

- DF = Direct to a Fix
- Kts = Knots
- MDA = Minimum Descent Altitude
- MVA = Minimum Vectoring Altitude
- MSL = Mean Sea Level
- NM = Nautical Miles
- PBN = Performance Based Navigation
- RNAV = Area Navigation
- RNP = Required Navigational Performance
- SIAP = Standard Instrument Approach Procedure
- SID = Standard Instrument Departure Procedure
- STAR = Standard Instrument Arrival Route
- TARGETS = Terminal Area Route Generation Evaluation and Traffic Simulation
- VA = Heading to an Altitude
- WP = Waypoint
- Fly Over WP = Aircraft will fly over the point before turning
- Fly By WP = Aircraft will start turn just before reaching the point and will not fly over the point during the turn

ANAC Noise Recommendation 14 – Reduce Noise in Mission Beach, Pacific Beach, and La Jolla

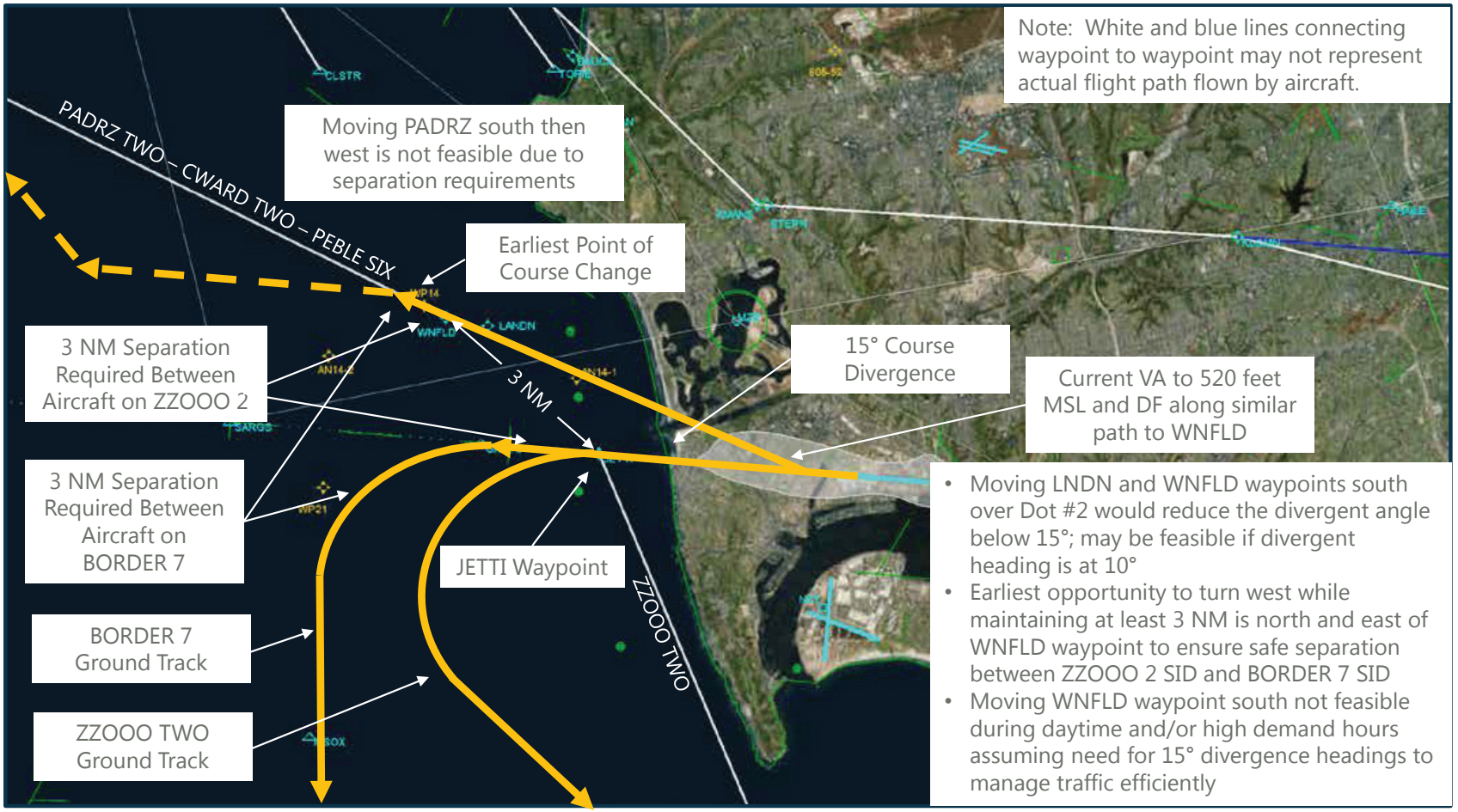
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Existing Flight Tracks



DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Day Time Issues



DRAFT Deliberative Document – For Discussion Purposes Only

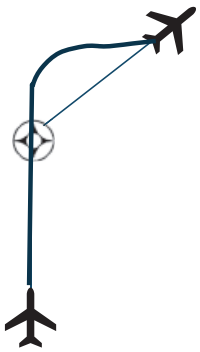
ANAC Noise Recommendation 14 - Alternatives

- **Alternative 1 – Fly By Turn at 1.5 NM from shoreline – Nighttime**
- Alternative 1 – Fly Over Turn at 1.5 NM from shoreline - Nighttime
- Alternative 2 – Fly By Turn at shoreline – Nighttime
- Alternative 3 – Fly By Turn at CNEL 65 contour - Nighttime
- ***Alternative 4 (new) – Fly By Turn between shoreline and 1.5 NM from shoreline - Nighttime***
- ***Alternative 5 (new) – ELSO 285° to Fly By waypoint at 1.5 NM thence to BROCK-2 - Nighttime***
- ***Alternative 6 (new) – ELSO 285°- Daytime***

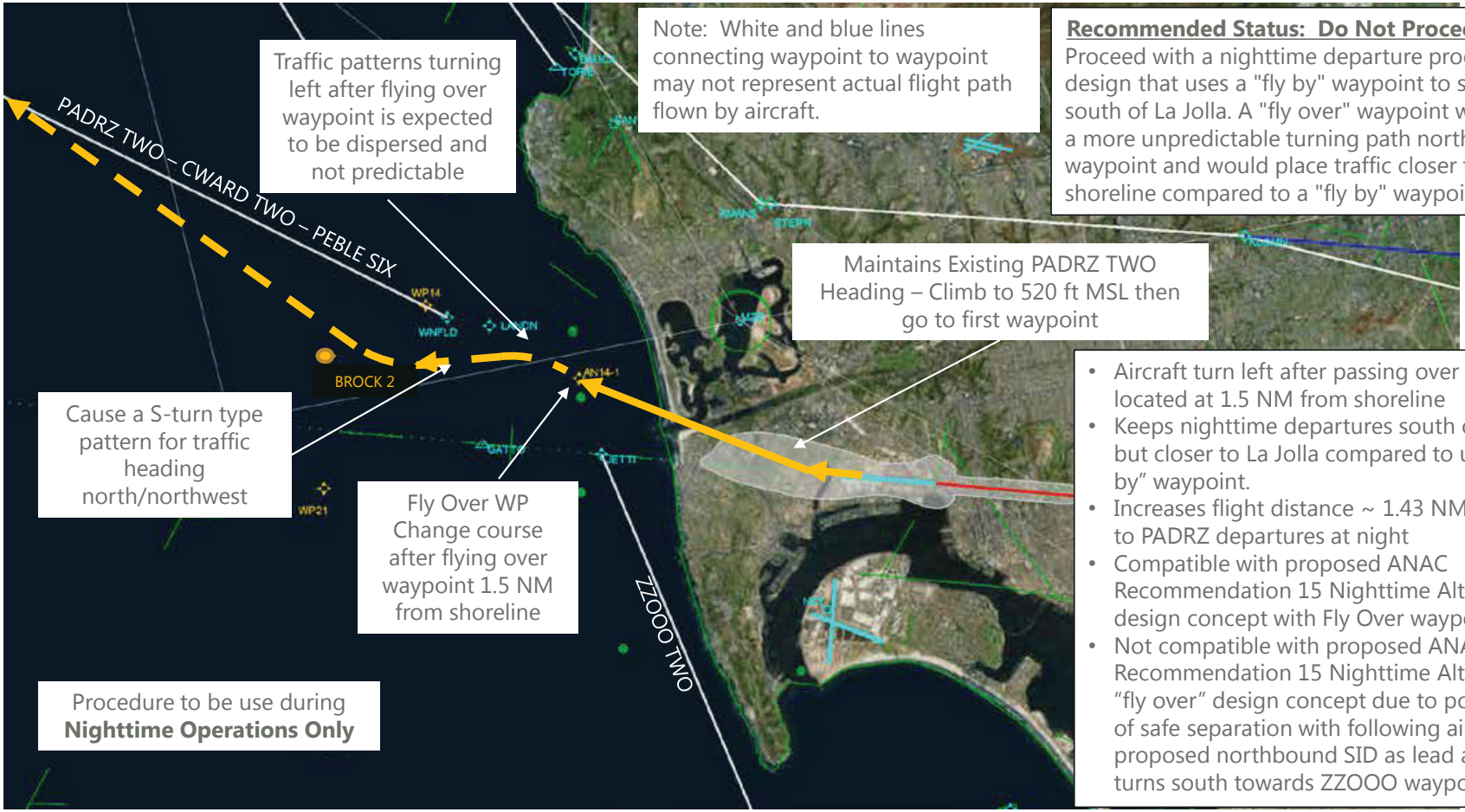
Note: Items in **bold** are recommended to proceed forward for further assessment;
Items in ***bold italics*** require input from TAC/CAC

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Alt 1 "Fly Over" Turn at 1.5 NM



Fly Over Waypoint



Traffic patterns turning left after flying over waypoint is expected to be dispersed and not predictable

Note: White and blue lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Do Not Proceed Forward

Proceed with a nighttime departure procedure design that uses a "fly by" waypoint to stay further south of La Jolla. A "fly over" waypoint would cause a more unpredictable turning path north of the waypoint and would place traffic closer to La Jolla shoreline compared to a "fly by" waypoint design.

Maintains Existing PADRZ TWO Heading – Climb to 520 ft MSL then go to first waypoint

Cause a S-turn type pattern for traffic heading north/northwest

Fly Over WP Change course after flying over waypoint 1.5 NM from shoreline

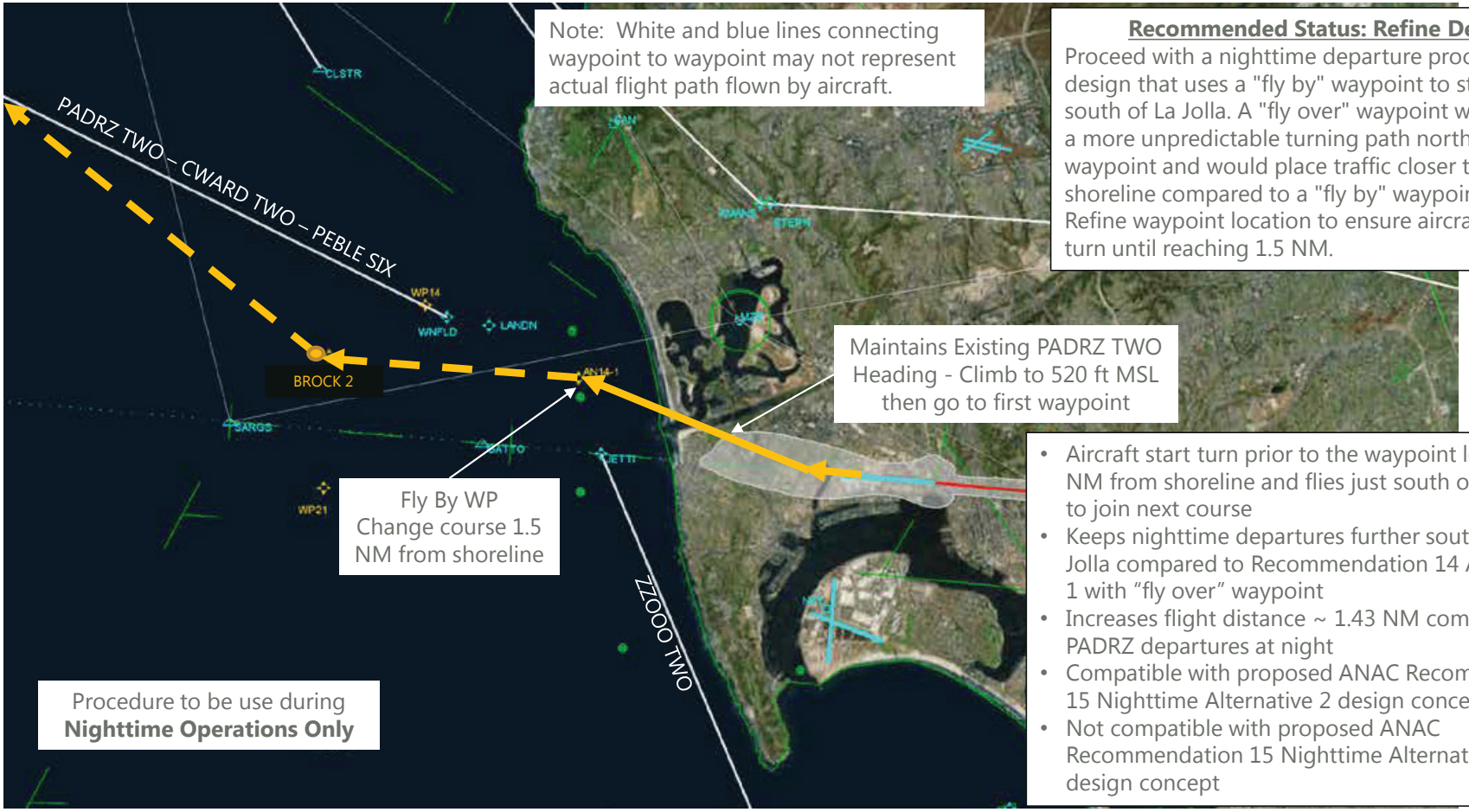
Procedure to be use during **Nighttime Operations Only**

- Aircraft turn left after passing over waypoint located at 1.5 NM from shoreline
- Keeps nighttime departures south of La Jolla, but closer to La Jolla compared to using a "fly by" waypoint.
- Increases flight distance ~ 1.43 NM compared to PADRZ departures at night
- Compatible with proposed ANAC Recommendation 15 Nighttime Alternative 3 design concept with Fly Over waypoint
- Not compatible with proposed ANAC Recommendation 15 Nighttime Alternative 2 "fly over" design concept due to potential loss of safe separation with following aircraft on proposed northbound SID as lead aircraft turns south towards ZZOOO waypoint

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Alt 1 "Fly By" Turn at 1.5 NM

Fly By Waypoint



Recommended Status: Refine Design

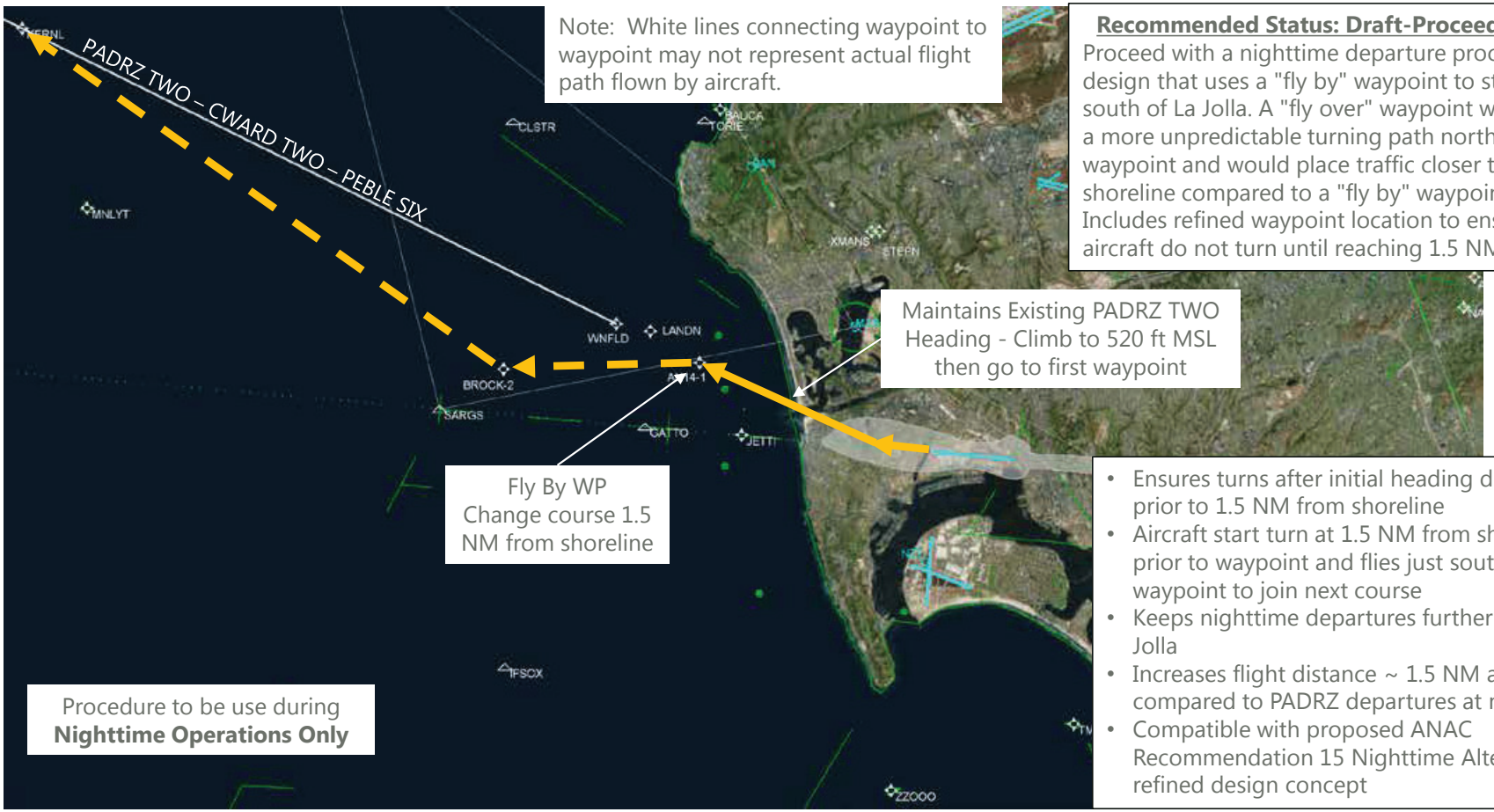
Proceed with a nighttime departure procedure design that uses a "fly by" waypoint to stay further south of La Jolla. A "fly over" waypoint would cause a more unpredictable turning path north of the waypoint and would place traffic closer to La Jolla shoreline compared to a "fly by" waypoint design. Refine waypoint location to ensure aircraft do not turn until reaching 1.5 NM.

- Aircraft start turn prior to the waypoint located 1.5 NM from shoreline and flies just south of waypoint to join next course
- Keeps nighttime departures further south of La Jolla compared to Recommendation 14 Alternative 1 with "fly over" waypoint
- Increases flight distance ~ 1.43 NM compared to PADRZ departures at night
- Compatible with proposed ANAC Recommendation 15 Nighttime Alternative 2 design concept
- Not compatible with proposed ANAC Recommendation 15 Nighttime Alternative 3 design concept

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Alt 1 "Fly By" Turn at 1.5 NM (Refined)

Fly By Waypoint



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Draft-Proceed Forward

Proceed with a nighttime departure procedure design that uses a "fly by" waypoint to stay further south of La Jolla. A "fly over" waypoint would cause a more unpredictable turning path north of the waypoint and would place traffic closer to La Jolla shoreline compared to a "fly by" waypoint design. Includes refined waypoint location to ensure aircraft do not turn until reaching 1.5 NM.

Maintains Existing PADRZ TWO Heading - Climb to 520 ft MSL then go to first waypoint

Fly By WP Change course 1.5 NM from shoreline

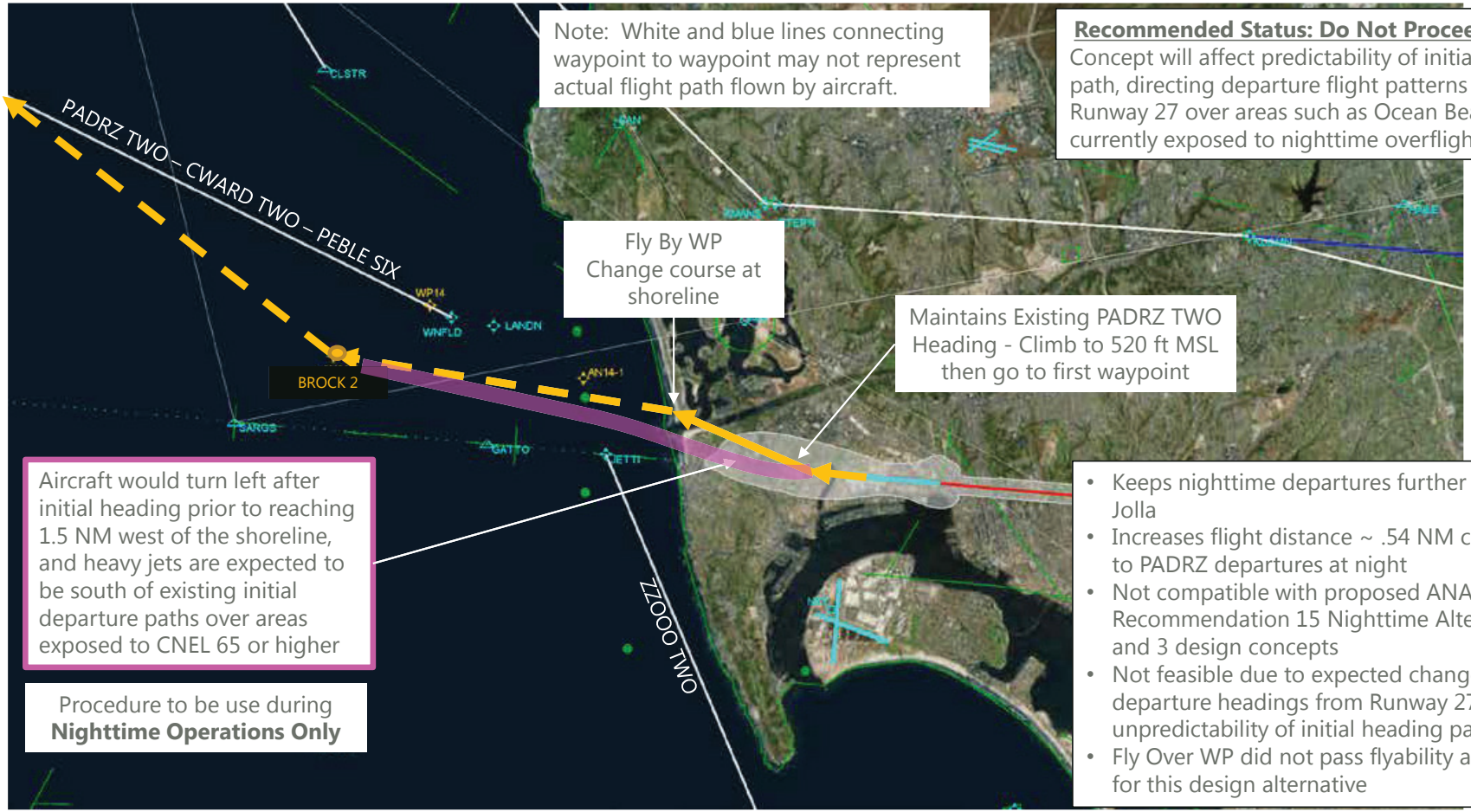
- Ensures turns after initial heading do not occur prior to 1.5 NM from shoreline
- Aircraft start turn at 1.5 NM from shoreline just prior to waypoint and flies just south of waypoint to join next course
- Keeps nighttime departures further south of La Jolla
- Increases flight distance ~ 1.5 NM as compared to PADRZ departures at night
- Compatible with proposed ANAC Recommendation 15 Nighttime Alternative 2 refined design concept

Procedure to be use during **Nighttime Operations Only**

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Alt 2 Turn at Shoreline

Fly By Waypoint



Note: White and blue lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Do Not Proceed Forward

Concept will affect predictability of initial departure path, directing departure flight patterns from Runway 27 over areas such as Ocean Beach not currently exposed to nighttime overflights

Fly By WP
Change course at shoreline

Maintains Existing PADRZ TWO Heading - Climb to 520 ft MSL then go to first waypoint

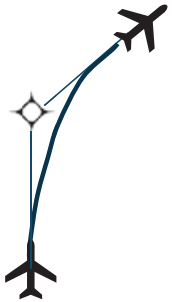
Aircraft would turn left after initial heading prior to reaching 1.5 NM west of the shoreline, and heavy jets are expected to be south of existing initial departure paths over areas exposed to CNEL 65 or higher

Procedure to be use during **Nighttime Operations Only**

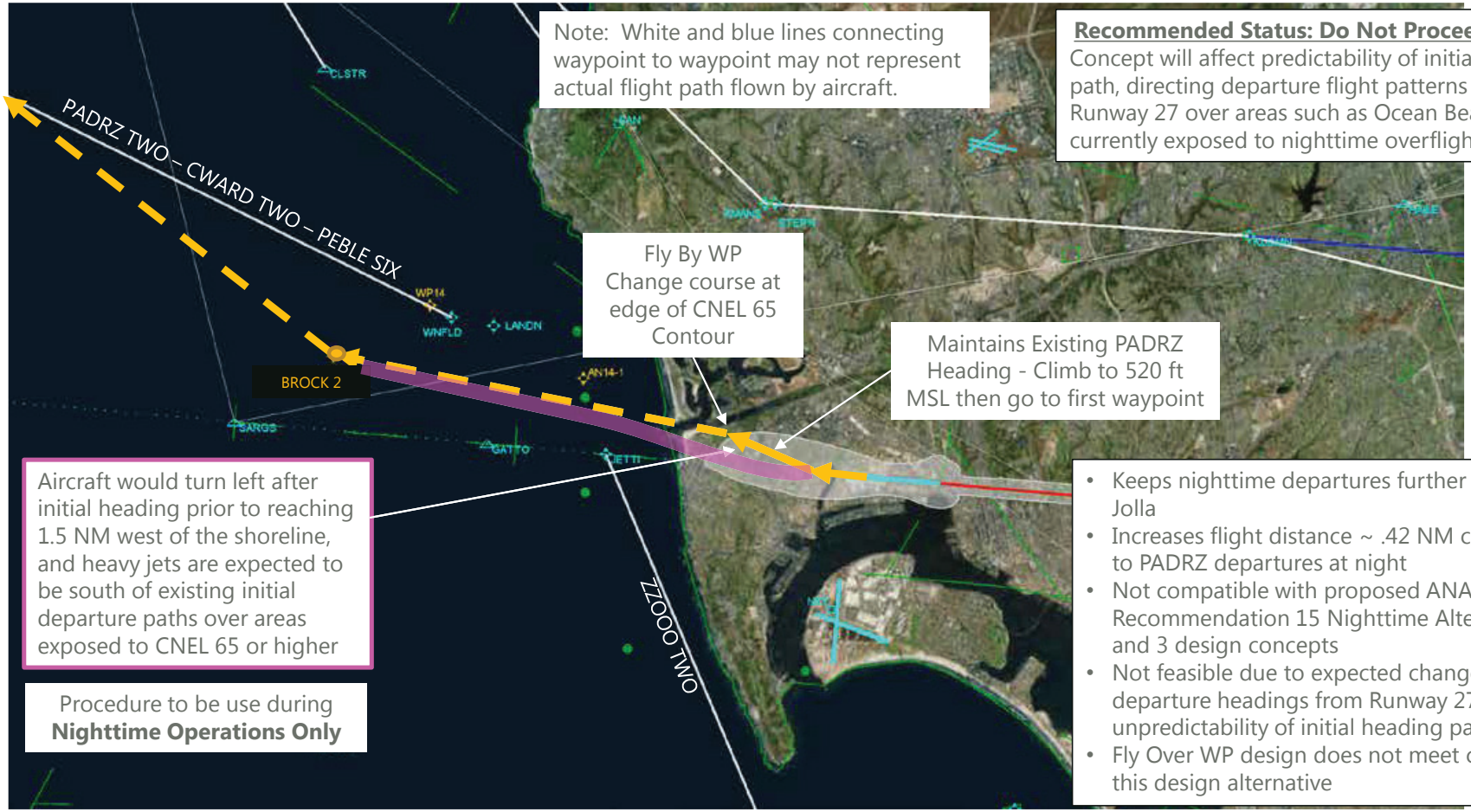
- Keeps nighttime departures further south of La Jolla
- Increases flight distance ~ .54 NM compared to PADRZ departures at night
- Not compatible with proposed ANAC Recommendation 15 Nighttime Alternative 2 and 3 design concepts
- Not feasible due to expected change in initial departure headings from Runway 27 and unpredictability of initial heading path.
- Fly Over WP did not pass flyability assessment for this design alternative

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Alt 3 Turn at CNEL 65 Contour



Fly By Waypoint



Note: White and blue lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Do Not Proceed Forward

Concept will affect predictability of initial departure path, directing departure flight patterns from Runway 27 over areas such as Ocean Beach not currently exposed to nighttime overflights.

Fly By WP
Change course at edge of CNEL 65 Contour

Maintains Existing PADRZ Heading - Climb to 520 ft MSL then go to first waypoint

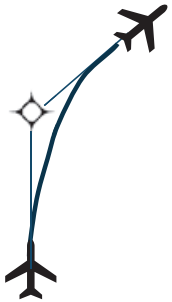
Aircraft would turn left after initial heading prior to reaching 1.5 NM west of the shoreline, and heavy jets are expected to be south of existing initial departure paths over areas exposed to CNEL 65 or higher

Procedure to be use during **Nighttime Operations Only**

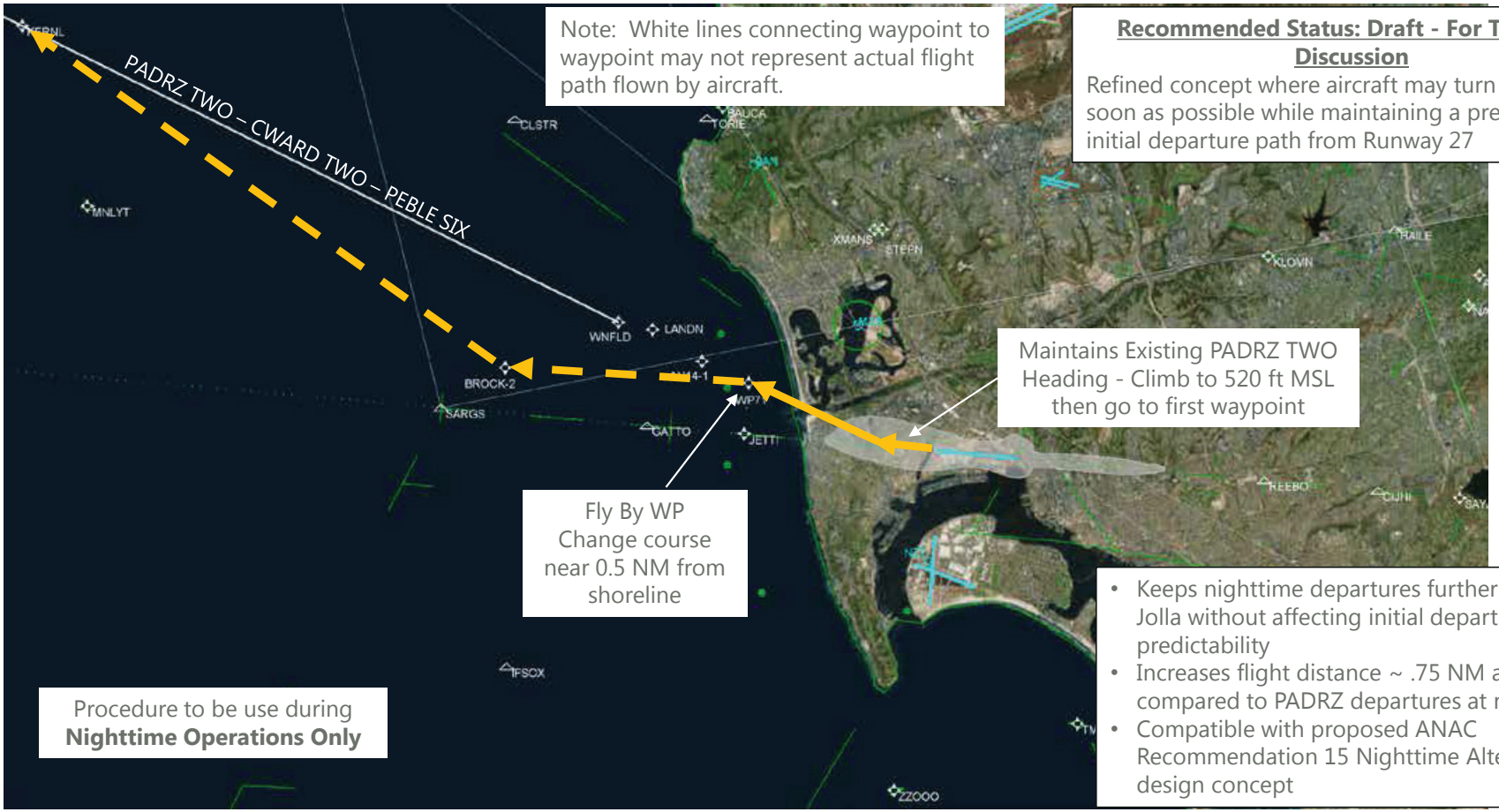
- Keeps nighttime departures further south of La Jolla
- Increases flight distance ~ .42 NM compared to PADRZ departures at night
- Not compatible with proposed ANAC Recommendation 15 Nighttime Alternative 2 and 3 design concepts
- Not feasible due to expected change in initial departure headings from Runway 27 and unpredictability of initial heading path.
- Fly Over WP design does not meet criteria for this design alternative

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 –Alt 4 Turn Between Shoreline and 1.5 NM



Fly By Waypoint



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Draft - For TAC/CAC Discussion

Refined concept where aircraft may turn west as soon as possible while maintaining a predictable initial departure path from Runway 27

Maintains Existing PADRZ TWO Heading - Climb to 520 ft MSL then go to first waypoint

Fly By WP Change course near 0.5 NM from shoreline

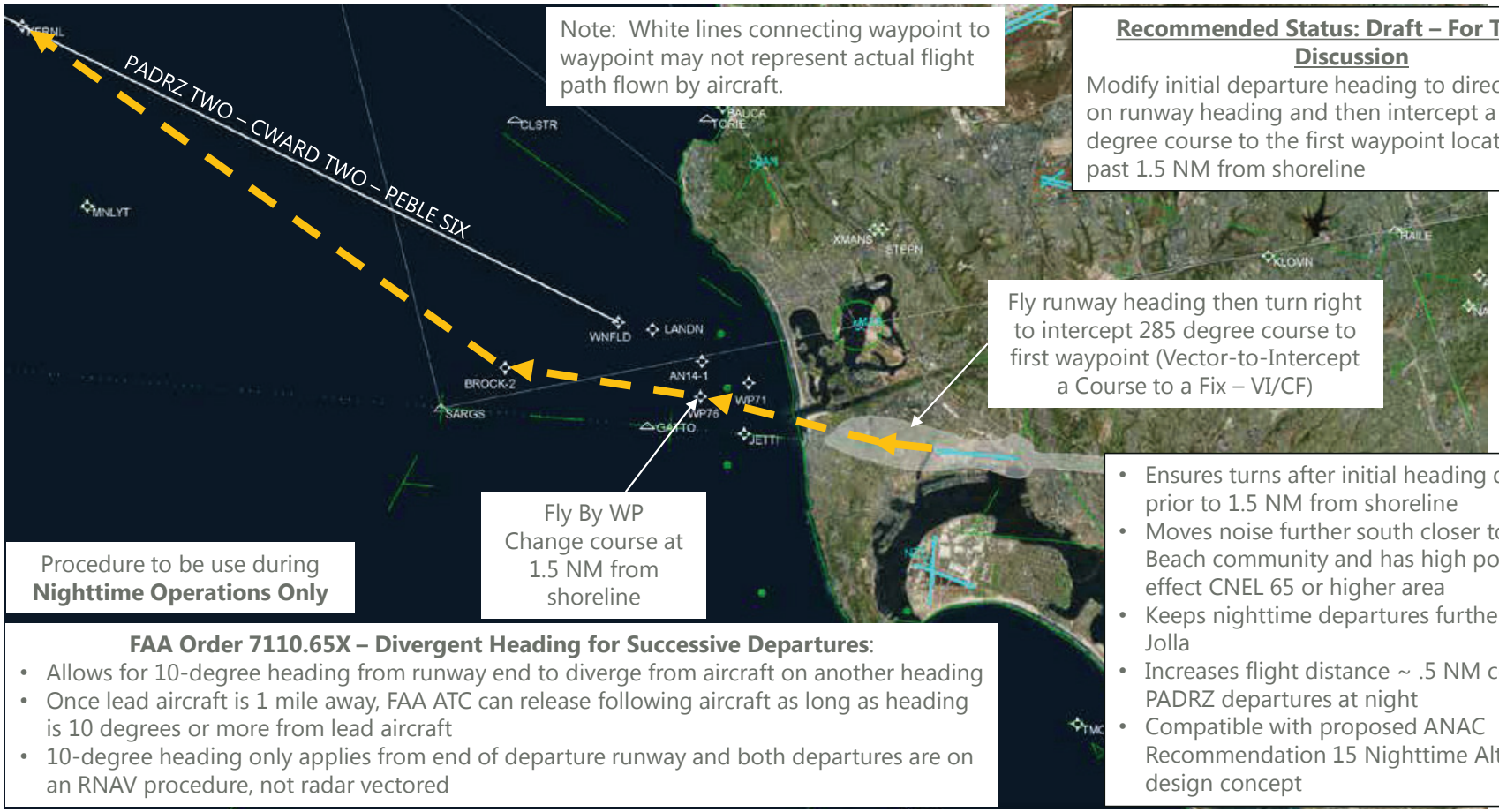
Procedure to be use during **Nighttime Operations Only**

- Keeps nighttime departures further south of La Jolla without affecting initial departure path predictability
- Increases flight distance ~ .75 NM as compared to PADRZ departures at night
- Compatible with proposed ANAC Recommendation 15 Nighttime Alternative 4 design concept

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 –Alt 5 ELSO to Fly By Turn at 1.5 NM

Fly By Waypoint



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Draft – For TAC/CAC Discussion

Modify initial departure heading to direct aircraft on runway heading and then intercept a 285 degree course to the first waypoint located just past 1.5 NM from shoreline

Fly runway heading then turn right to intercept 285 degree course to first waypoint (Vector-to-Intercept a Course to a Fix – VI/CF)

Fly By WP Change course at 1.5 NM from shoreline

Procedure to be use during **Nighttime Operations Only**

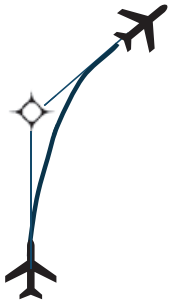
FAA Order 7110.65X – Divergent Heading for Successive Departures:

- Allows for 10-degree heading from runway end to diverge from aircraft on another heading
- Once lead aircraft is 1 mile away, FAA ATC can release following aircraft as long as heading is 10 degrees or more from lead aircraft
- 10-degree heading only applies from end of departure runway and both departures are on an RNAV procedure, not radar vectored

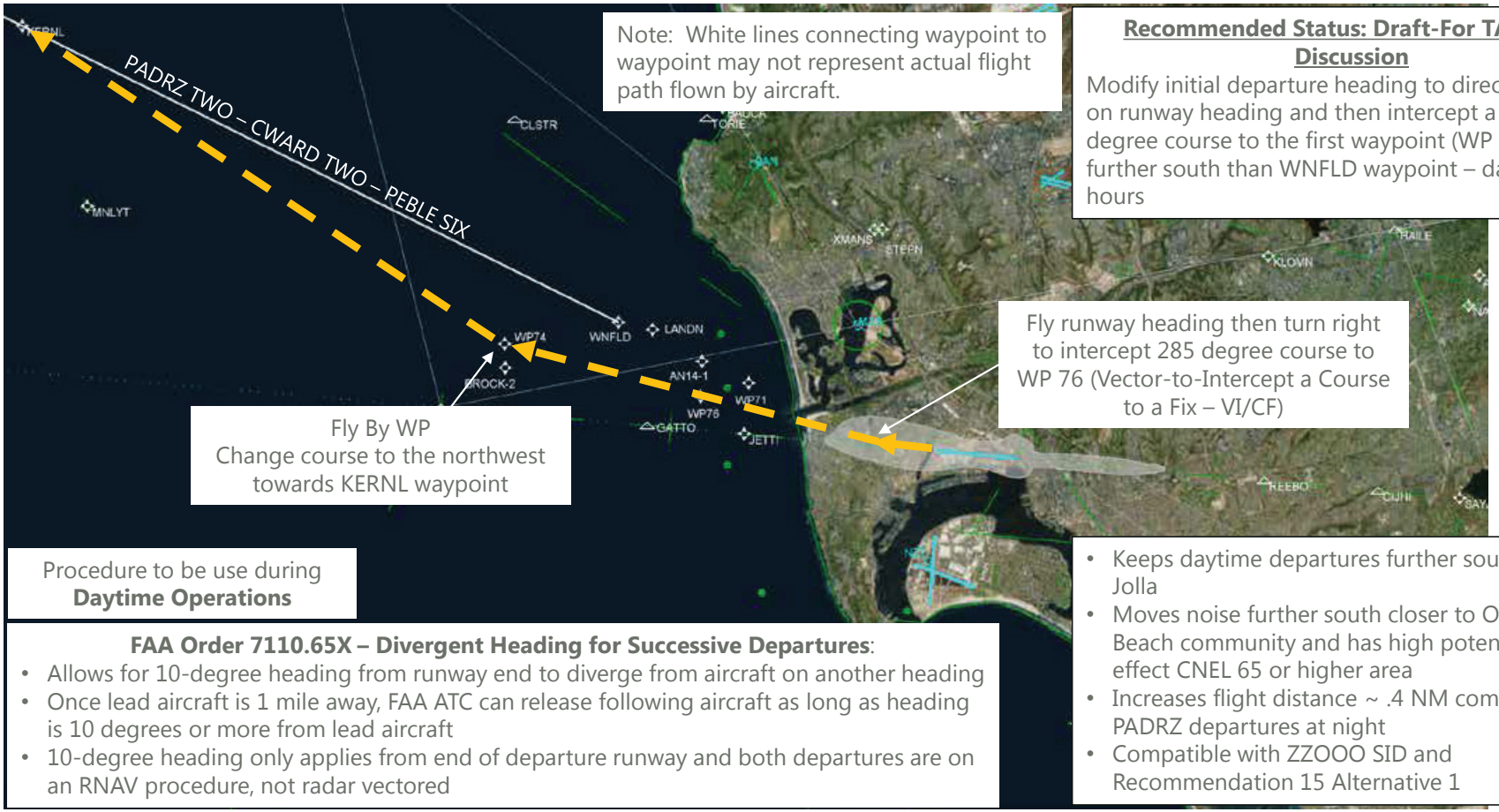
- Ensures turns after initial heading do not occur prior to 1.5 NM from shoreline
- Moves noise further south closer to Ocean Beach community and has high potential to effect CNEL 65 or higher area
- Keeps nighttime departures further south of La Jolla
- Increases flight distance ~ .5 NM compared to PADRZ departures at night
- Compatible with proposed ANAC Recommendation 15 Nighttime Alternative 5 design concept

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Alt 6 ELSO Day



Fly By Waypoint



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Draft-For TAC/CAC Discussion

Modify initial departure heading to direct aircraft on runway heading and then intercept a 285 degree course to the first waypoint (WP 76) that is further south than WNFLD waypoint – daytime hours

Fly runway heading then turn right to intercept 285 degree course to WP 76 (Vector-to-Intercept a Course to a Fix – VI/CF)

Fly By WP
Change course to the northwest towards KERNL waypoint

Procedure to be use during **Daytime Operations**

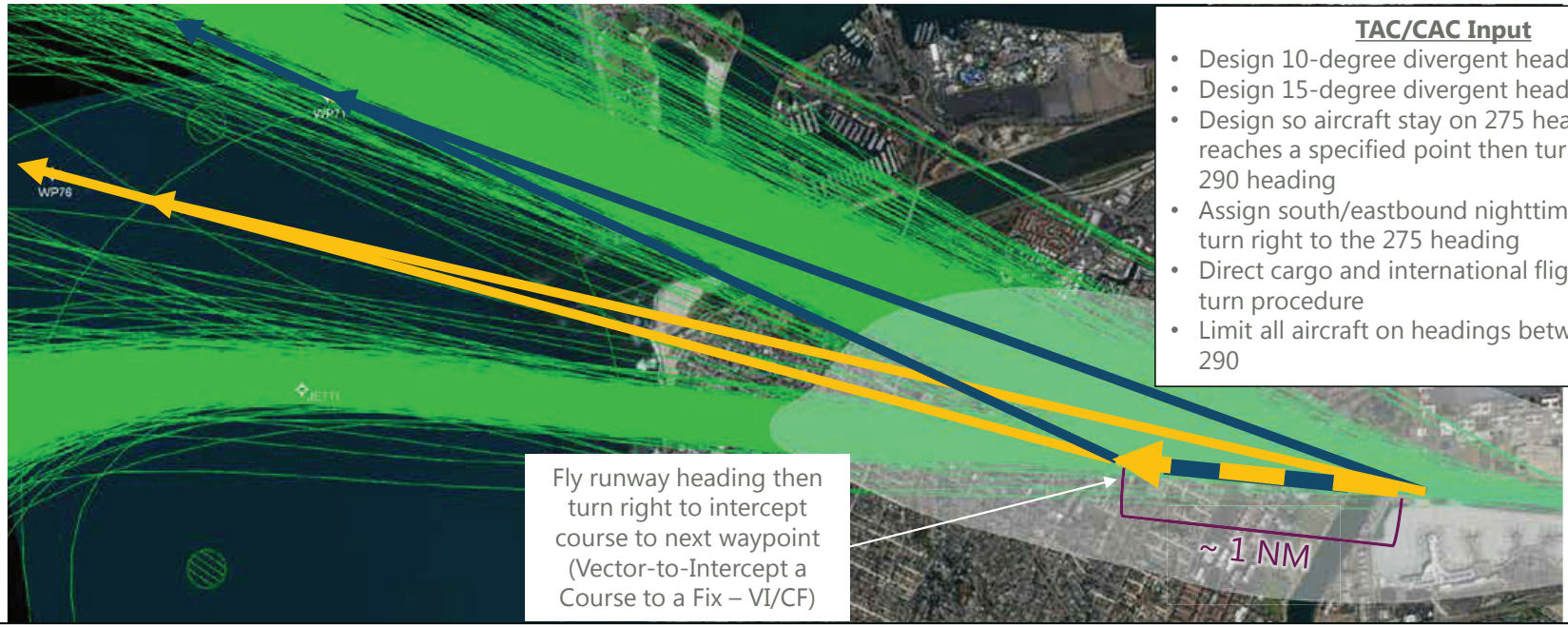
FAA Order 7110.65X – Divergent Heading for Successive Departures:

- Allows for 10-degree heading from runway end to diverge from aircraft on another heading
- Once lead aircraft is 1 mile away, FAA ATC can release following aircraft as long as heading is 10 degrees or more from lead aircraft
- 10-degree heading only applies from end of departure runway and both departures are on an RNAV procedure, not radar vectored

- Keeps daytime departures further south of La Jolla
- Moves noise further south closer to Ocean Beach community and has high potential to effect CNEL 65 or higher area
- Increases flight distance ~ .4 NM compared to PADRZ departures at night
- Compatible with ZZOOO SID and Recommendation 15 Alternative 1

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 14 – Initial Heading Input



TAC/CAC Input

- Design 10-degree divergent heading (285)
- Design 15-degree divergent heading (290)
- Design so aircraft stay on 275 heading until it reaches a specified point then turn right on 290 heading
- Assign south/eastbound nighttime aircraft that turn right to the 275 heading
- Direct cargo and international flights to right turn procedure
- Limit all aircraft on headings between 275 and 290

Fly runway heading and turn right to join 285-degree magnetic course to first waypoint (Vector-to-Intercept a Course to a Fix-VI/CF)

Fly runway heading and turn right to join 290-degree magnetic course to first waypoint (Vector-to-Intercept a Course to a Fix-VI/CF)

Radar Flight Tracks:

North/Northwest Traffic on PADRZ SID – Fly runway heading until 520 feet MSL then turn right and go to WNFLD waypoint (Vector-to-Altitude then Direct to Fix – VA/DF) – heading to WNFLD depends on when aircraft reaches 520 feet MSL

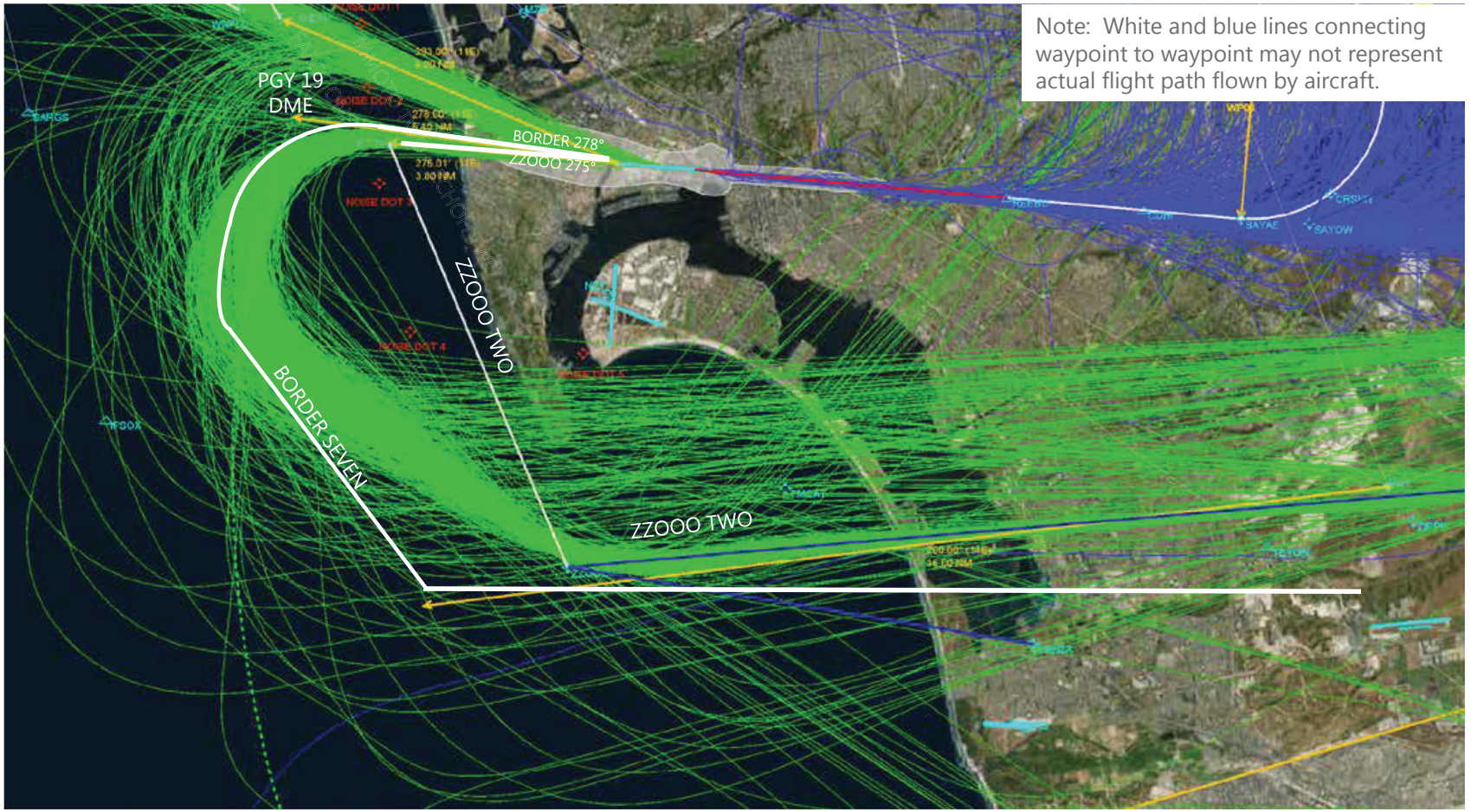
South/East Traffic on ZZOOO SID - Stay on 275 to JETTI waypoint

South/East Traffic at Night – Issued 290 heading by SAN Air Traffic Control Tower and continue until 1.5 NM from shoreline

ANAC Noise Recommendation 15 – Reduce Noise Over the Point Loma Peninsula and La Jolla

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Existing Flight Tracks



Note: White and blue lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

DRAFT Deliberative Document – For Discussion Purposes Only

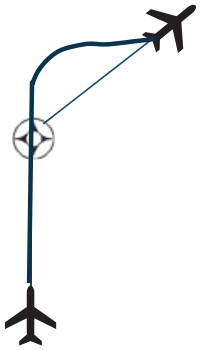
ANAC Noise Recommendation 15 - Alternatives

- **Alternative 1 – Extend JETTI Waypoint 2 NM West**
- **Alternative 2 –Fly By Turn at 1.5 NM then to ZZOOO Waypoint - Nighttime**
- Alternative 3 –Fly Over Turn at 1.5 NM then to ZZOOO Waypoint - Nighttime
- ***Alternative 4 (New) –Fly By Turn between shoreline and 1.5 NM from shoreline then to ZZOOO waypoint - Nighttime***
- ***Alternative 5 (New) – ELSO 285° to Fly By waypoint at 1.5 NM then to ZZOOO - Nighttime***

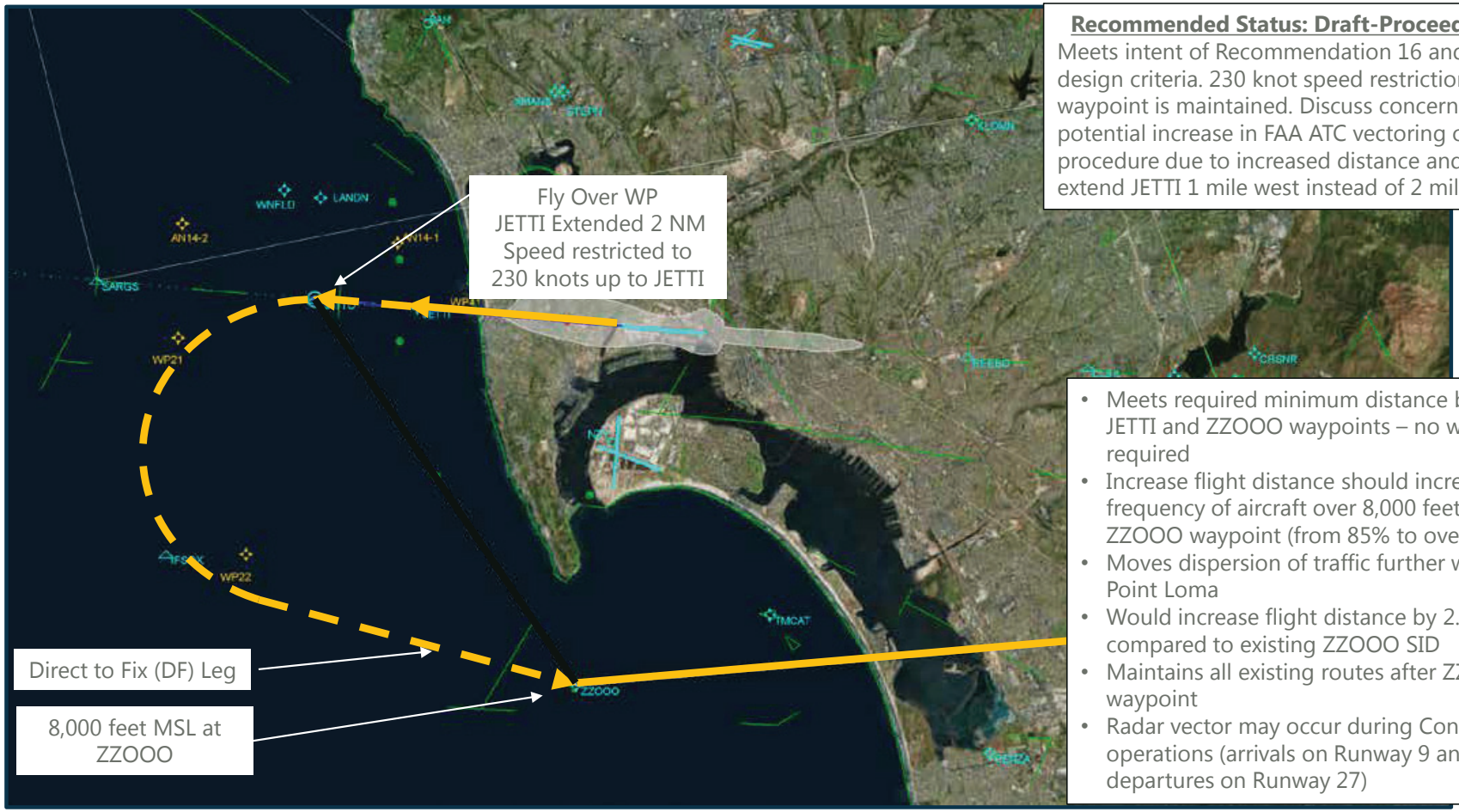
Note: Items in **bold** are recommended to proceed forward for further assessment;
Items in ***bold italics*** require input from TAC/CAC

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Alt 1 Extend JETTI Waypoint 2 NM West



Fly Over Waypoint



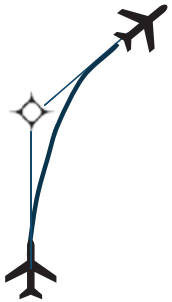
Recommended Status: Draft-Proceed Forward

Meets intent of Recommendation 16 and meets design criteria. 230 knot speed restriction to JETTI waypoint is maintained. Discuss concerns related to potential increase in FAA ATC vectoring off procedure due to increased distance and option to extend JETTI 1 mile west instead of 2 miles west.

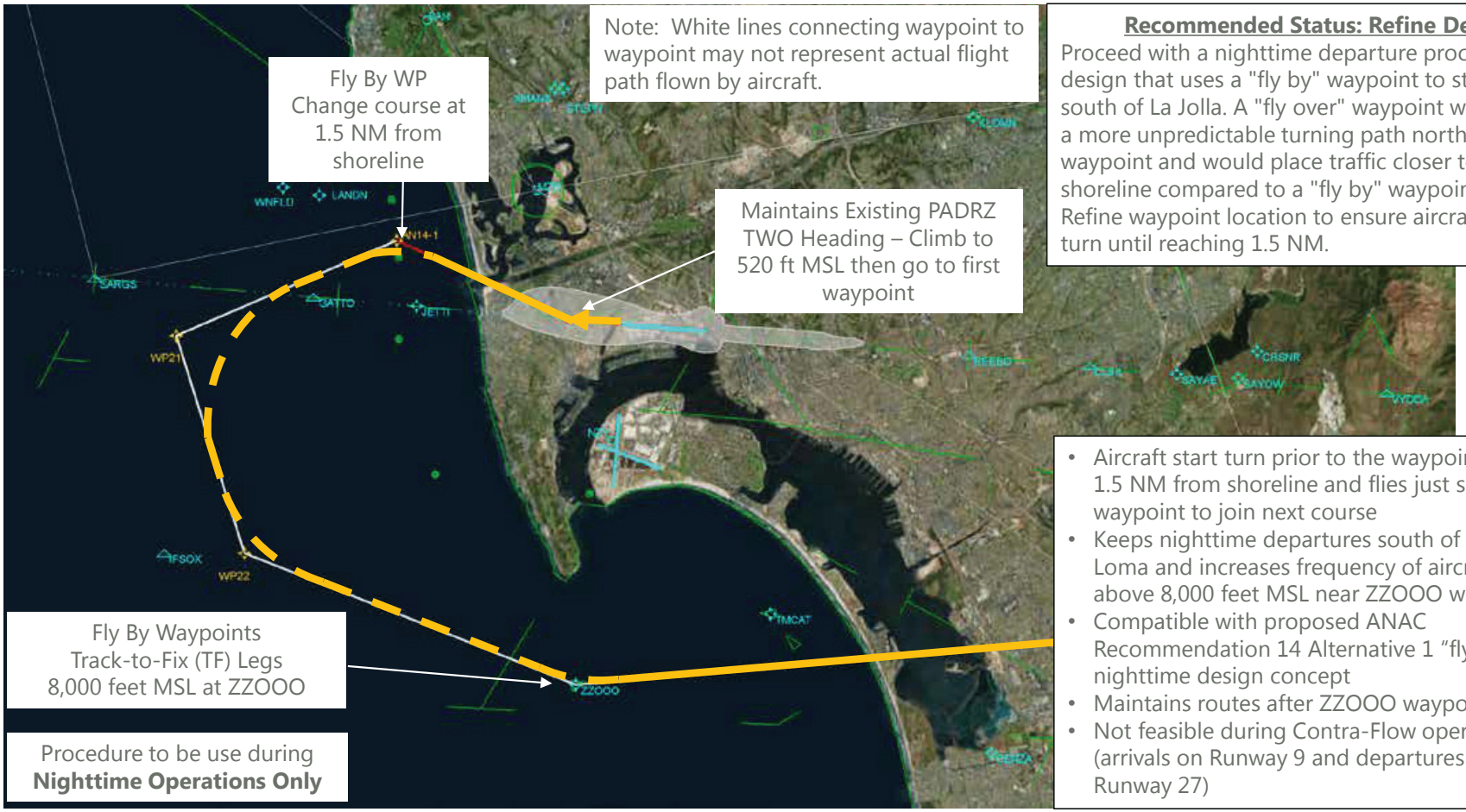
- Meets required minimum distance between JETTI and ZZOOO waypoints – no waiver required
- Increase flight distance should increase frequency of aircraft over 8,000 feet MSL near ZZOOO waypoint (from 85% to over 95%)
- Moves dispersion of traffic further west from Point Loma
- Would increase flight distance by 2.95 NM compared to existing ZZOOO SID
- Maintains all existing routes after ZZOOO waypoint
- Radar vector may occur during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Alt 2 "Fly By" Turn at 1.5 NM



Fly By Waypoint



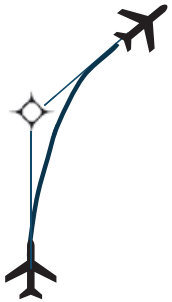
Recommended Status: Refine Design

Proceed with a nighttime departure procedure design that uses a "fly by" waypoint to stay further south of La Jolla. A "fly over" waypoint would cause a more unpredictable turning path north of the waypoint and would place traffic closer to La Jolla shoreline compared to a "fly by" waypoint design. Refine waypoint location to ensure aircraft do not turn until reaching 1.5 NM.

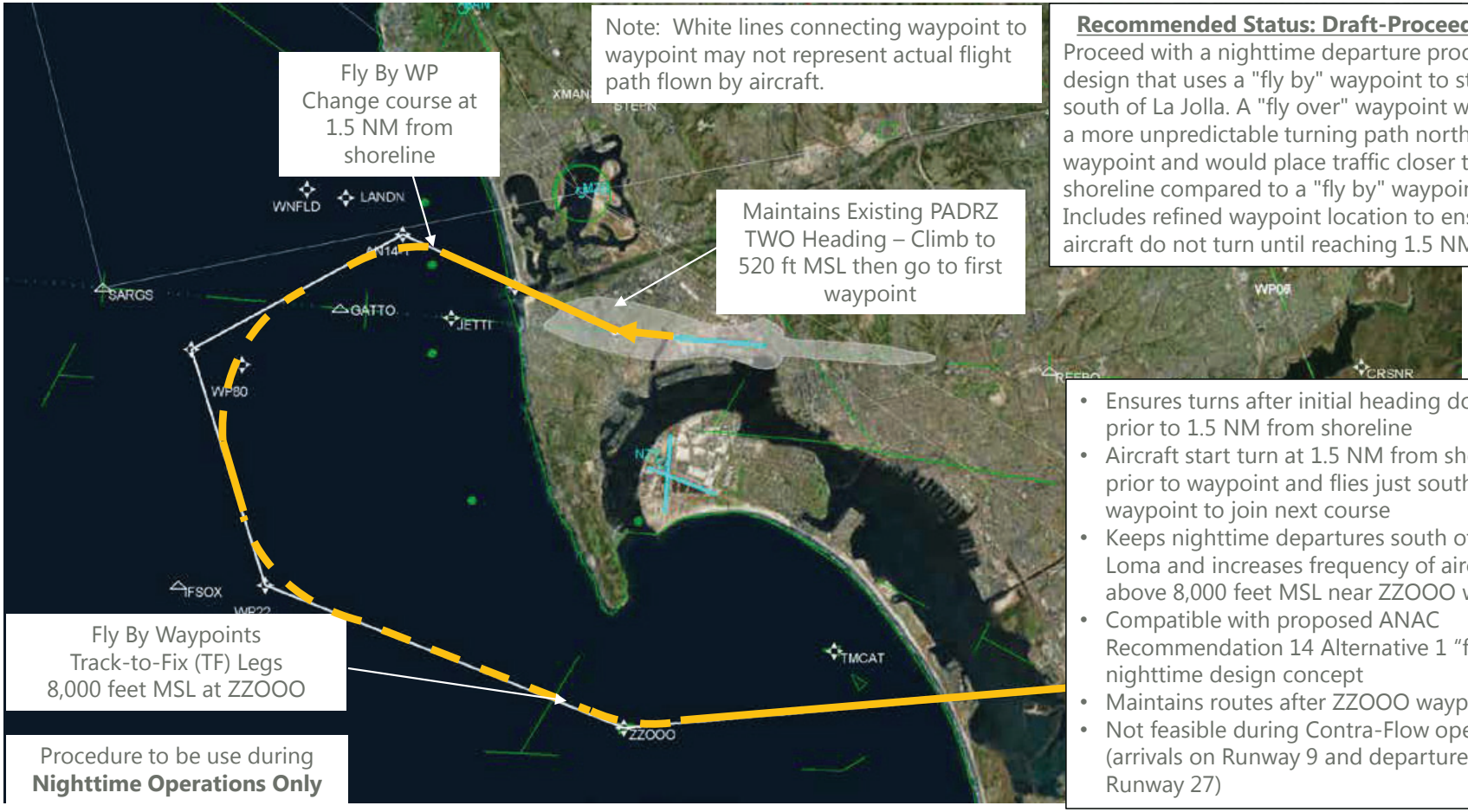
- Aircraft start turn prior to the waypoint located 1.5 NM from shoreline and flies just south of waypoint to join next course
- Keeps nighttime departures south of Point Loma and increases frequency of aircraft at or above 8,000 feet MSL near ZZOOO waypoint
- Compatible with proposed ANAC Recommendation 14 Alternative 1 "fly by" nighttime design concept
- Maintains routes after ZZOOO waypoint
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Alt 2 "Fly By" Turn at 1.5 NM (Refined)



Fly By Waypoint



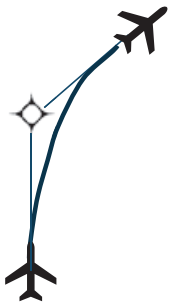
Recommended Status: Draft-Proceed Forward

Proceed with a nighttime departure procedure design that uses a "fly by" waypoint to stay further south of La Jolla. A "fly over" waypoint would cause a more unpredictable turning path north of the waypoint and would place traffic closer to La Jolla shoreline compared to a "fly by" waypoint design. Includes refined waypoint location to ensure aircraft do not turn until reaching 1.5 NM.

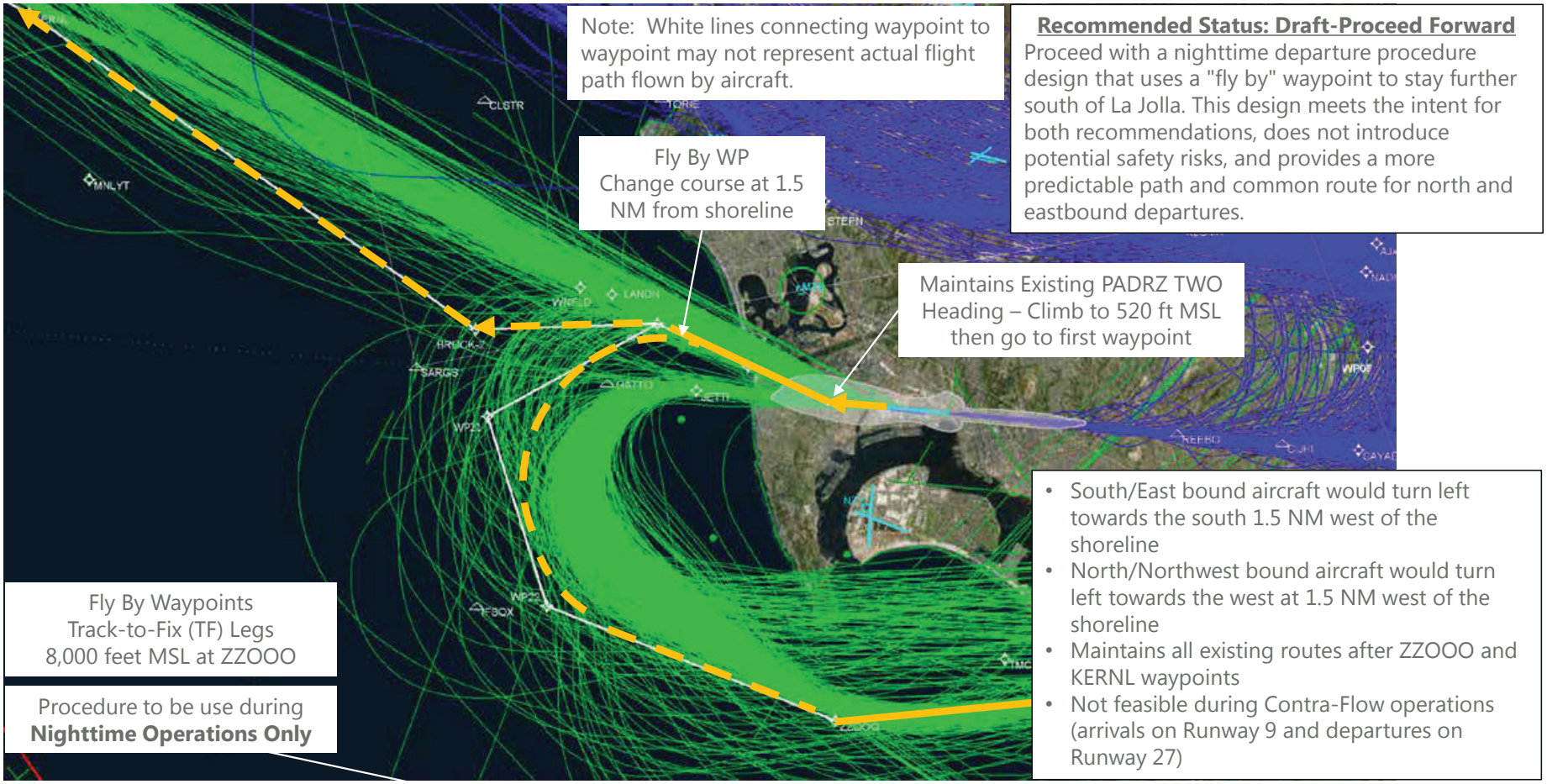
- Ensures turns after initial heading do not occur prior to 1.5 NM from shoreline
- Aircraft start turn at 1.5 NM from shoreline just prior to waypoint and flies just south of waypoint to join next course
- Keeps nighttime departures south of Point Loma and increases frequency of aircraft at or above 8,000 feet MSL near ZZOOO waypoint
- Compatible with proposed ANAC Recommendation 14 Alternative 1 "fly by" nighttime design concept
- Maintains routes after ZZOOO waypoint
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 1 "Fly By" and Recommendation 15 Alt 2



Fly By Waypoint



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Fly By WP
Change course at 1.5 NM from shoreline

Maintains Existing PADRZ TWO Heading – Climb to 520 ft MSL then go to first waypoint

Recommended Status: Draft-Proceed Forward

Proceed with a nighttime departure procedure design that uses a "fly by" waypoint to stay further south of La Jolla. This design meets the intent for both recommendations, does not introduce potential safety risks, and provides a more predictable path and common route for north and eastbound departures.

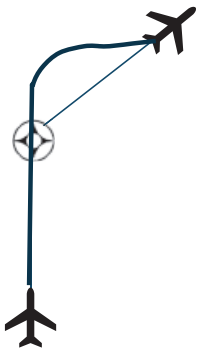
Fly By Waypoints
Track-to-Fix (TF) Legs
8,000 feet MSL at ZZOOO

Procedure to be use during **Nighttime Operations Only**

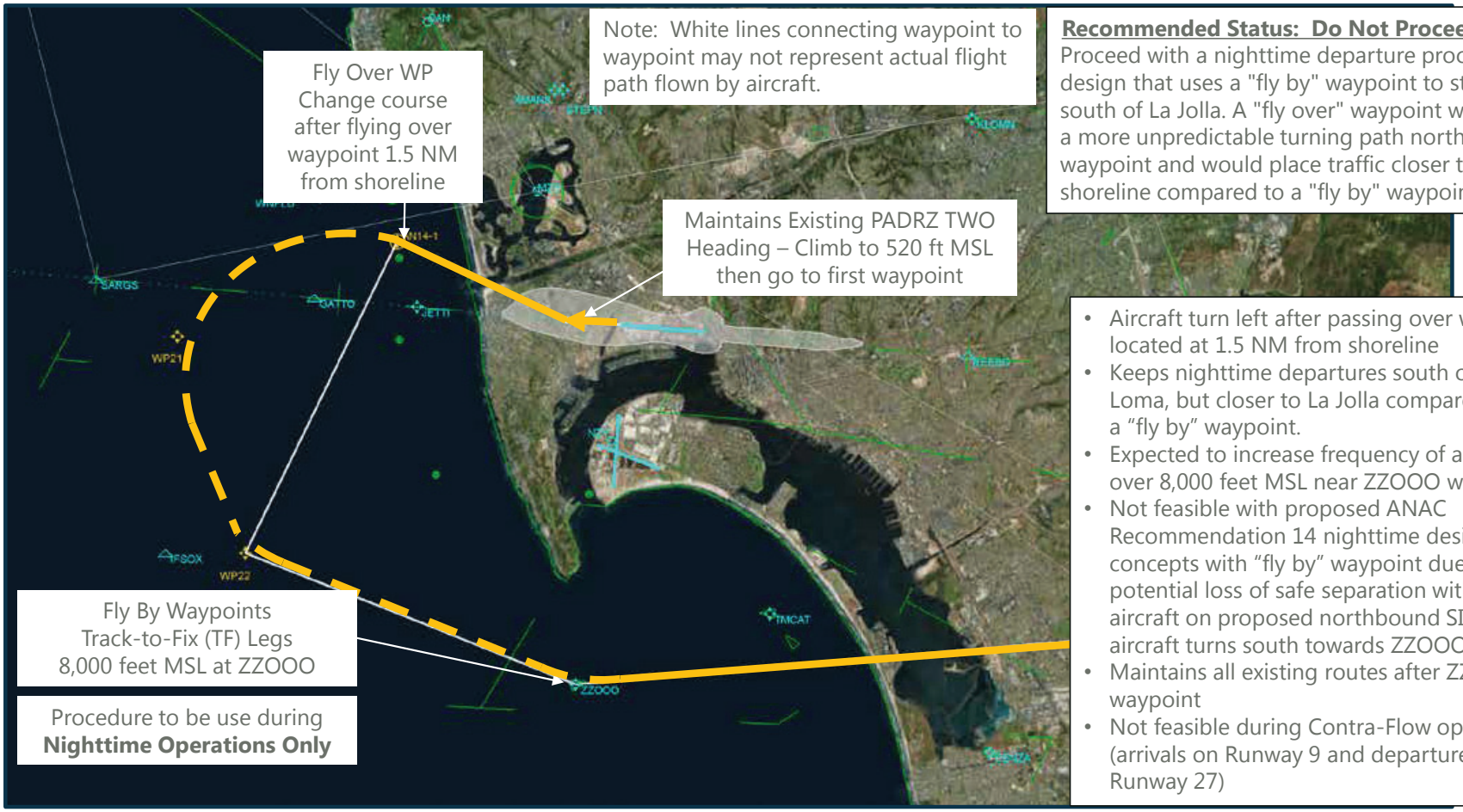
- South/East bound aircraft would turn left towards the south 1.5 NM west of the shoreline
- North/Northwest bound aircraft would turn left towards the west at 1.5 NM west of the shoreline
- Maintains all existing routes after ZZOOO and KERNL waypoints
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Alt 3 "Fly Over" Turn at 1.5 NM



Fly Over Waypoint



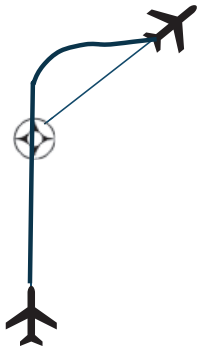
Recommended Status: Do Not Proceed Forward

Proceed with a nighttime departure procedure design that uses a "fly by" waypoint to stay further south of La Jolla. A "fly over" waypoint would cause a more unpredictable turning path north of the waypoint and would place traffic closer to La Jolla shoreline compared to a "fly by" waypoint design.

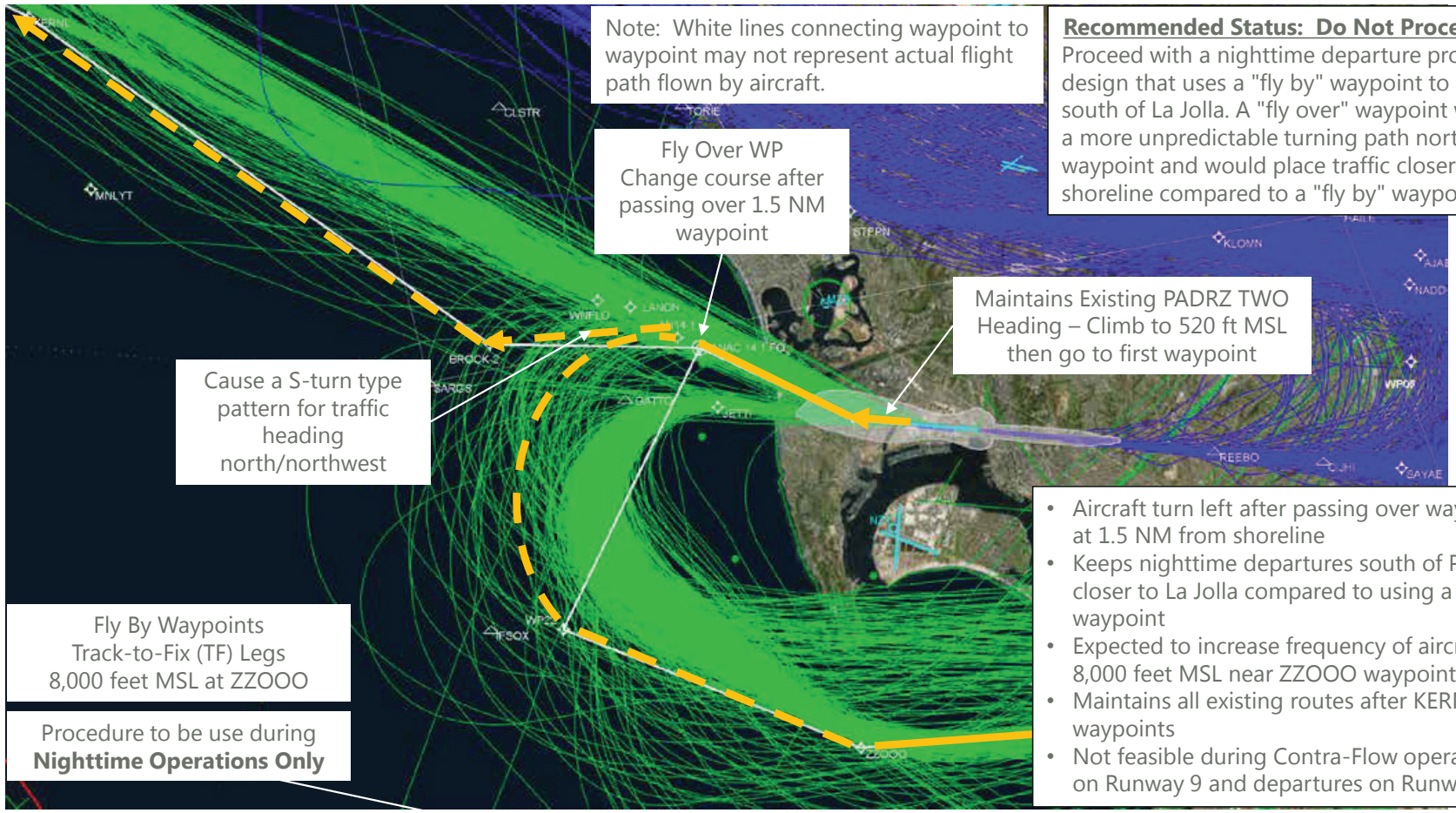
- Aircraft turn left after passing over waypoint located at 1.5 NM from shoreline
- Keeps nighttime departures south of Point Loma, but closer to La Jolla compared to using a "fly by" waypoint.
- Expected to increase frequency of aircraft at or over 8,000 feet MSL near ZZOOO waypoint,
- Not feasible with proposed ANAC Recommendation 14 nighttime design concepts with "fly by" waypoint due to potential loss of safe separation with following aircraft on proposed northbound SID as lead aircraft turns south towards ZZOOO waypoint
- Maintains all existing routes after ZZOOO waypoint
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 1 "Fly Over" and Recommendation 15 Alt 3



Fly Over Waypoint



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Do Not Proceed Forward
Proceed with a nighttime departure procedure design that uses a "fly by" waypoint to stay further south of La Jolla. A "fly over" waypoint would cause a more unpredictable turning path north of the waypoint and would place traffic closer to La Jolla shoreline compared to a "fly by" waypoint design.

Fly Over WP
Change course after passing over 1.5 NM waypoint

Maintains Existing PADRZ TWO Heading – Climb to 520 ft MSL then go to first waypoint

Cause a S-turn type pattern for traffic heading north/northwest

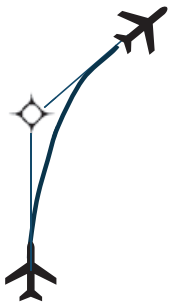
- Aircraft turn left after passing over waypoint located at 1.5 NM from shoreline
- Keeps nighttime departures south of Point Loma, but closer to La Jolla compared to using a "fly by" waypoint
- Expected to increase frequency of aircraft at or over 8,000 feet MSL near ZZOOO waypoint,.
- Maintains all existing routes after KERNL and ZZOOO waypoints
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Fly By Waypoints
Track-to-Fix (TF) Legs
8,000 feet MSL at ZZOOO

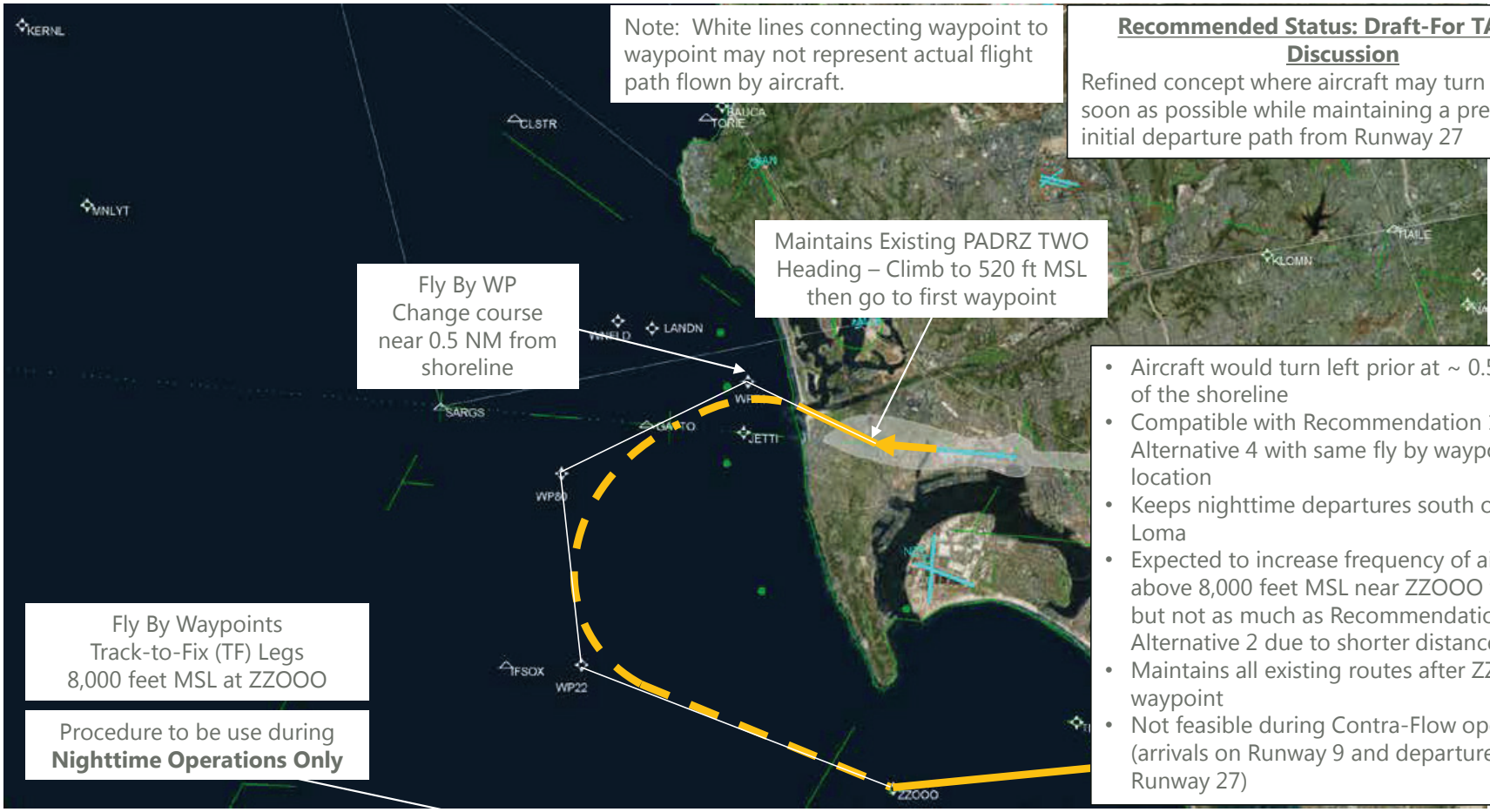
Procedure to be use during **Nighttime Operations Only**

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Alt 4 Turn Between Shoreline and 1.5 NM



Fly By Waypoint



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Draft-For TAC/CAC Discussion

Refined concept where aircraft may turn west as soon as possible while maintaining a predictable initial departure path from Runway 27

Maintains Existing PADRZ TWO Heading – Climb to 520 ft MSL then go to first waypoint

Fly By WP Change course near 0.5 NM from shoreline

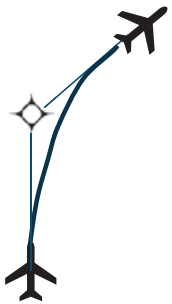
Fly By Waypoints Track-to-Fix (TF) Legs 8,000 feet MSL at ZZOOO

Procedure to be use during **Nighttime Operations Only**

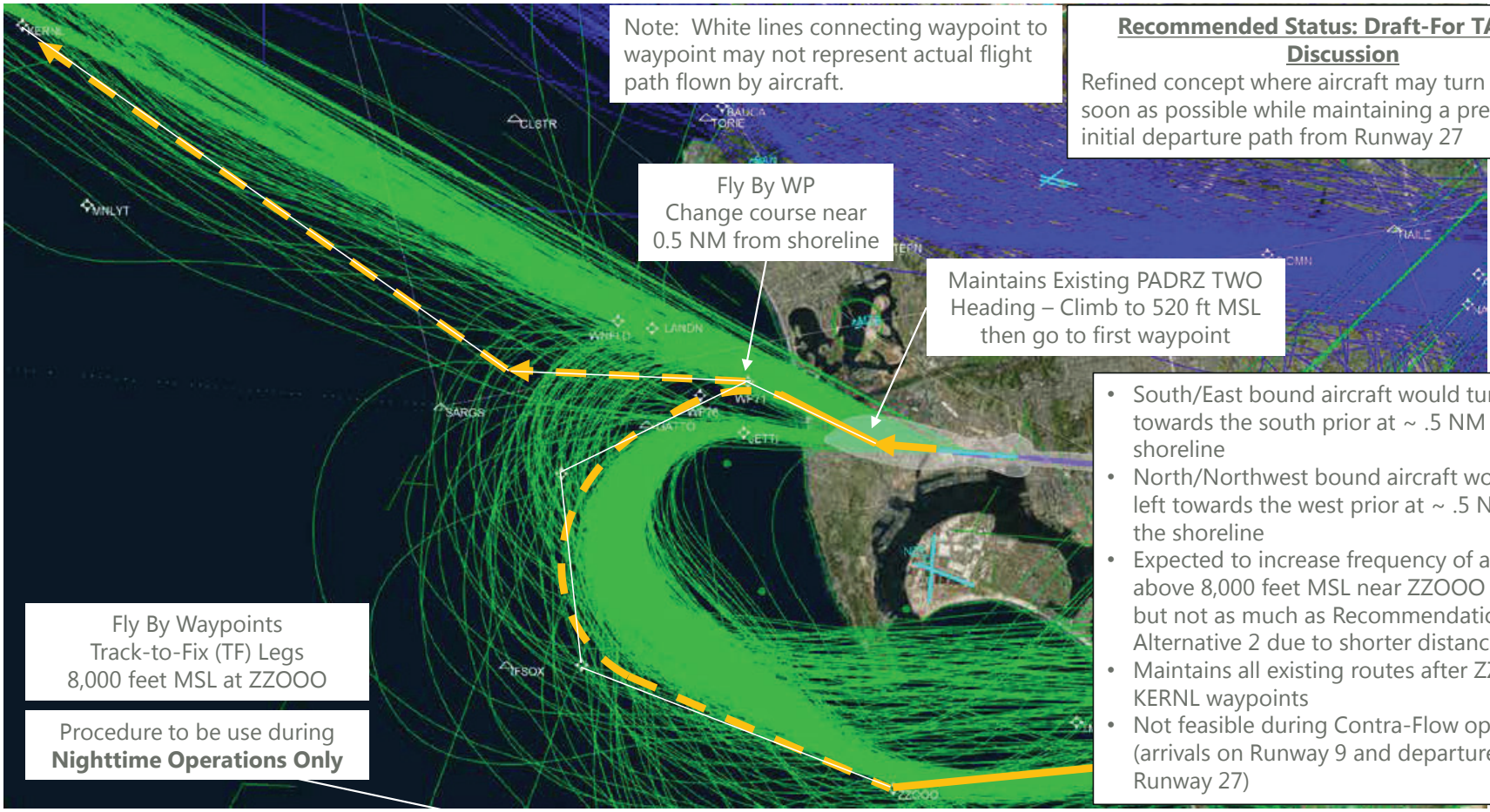
- Aircraft would turn left prior at ~ 0.5 NM west of the shoreline
- Compatible with Recommendation 14 – Alternative 4 with same fly by waypoint location
- Keeps nighttime departures south of Point Loma
- Expected to increase frequency of aircraft at or above 8,000 feet MSL near ZZOOO waypoint, but not as much as Recommendation 15 Alternative 2 due to shorter distance
- Maintains all existing routes after ZZOOO waypoint
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 4 and Recommendation 15 Alt 4



Fly By Waypoint



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Draft-For TAC/CAC Discussion

Refined concept where aircraft may turn west as soon as possible while maintaining a predictable initial departure path from Runway 27

Fly By WP
Change course near
0.5 NM from shoreline

Maintains Existing PADRZ TWO Heading – Climb to 520 ft MSL then go to first waypoint

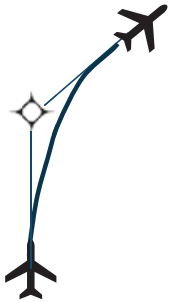
- South/East bound aircraft would turn left towards the south prior at ~ .5 NM west of the shoreline
- North/Northwest bound aircraft would turn left towards the west prior at ~ .5 NM west of the shoreline
- Expected to increase frequency of aircraft at or above 8,000 feet MSL near ZZOOO waypoint, but not as much as Recommendation 15 Alternative 2 due to shorter distance
- Maintains all existing routes after ZZOOO and KERNL waypoints
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Fly By Waypoints
Track-to-Fix (TF) Legs
8,000 feet MSL at ZZOOO

Procedure to be use during **Nighttime Operations Only**

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Alt 5 ELSO to Fly By Turn at 1.5 NM



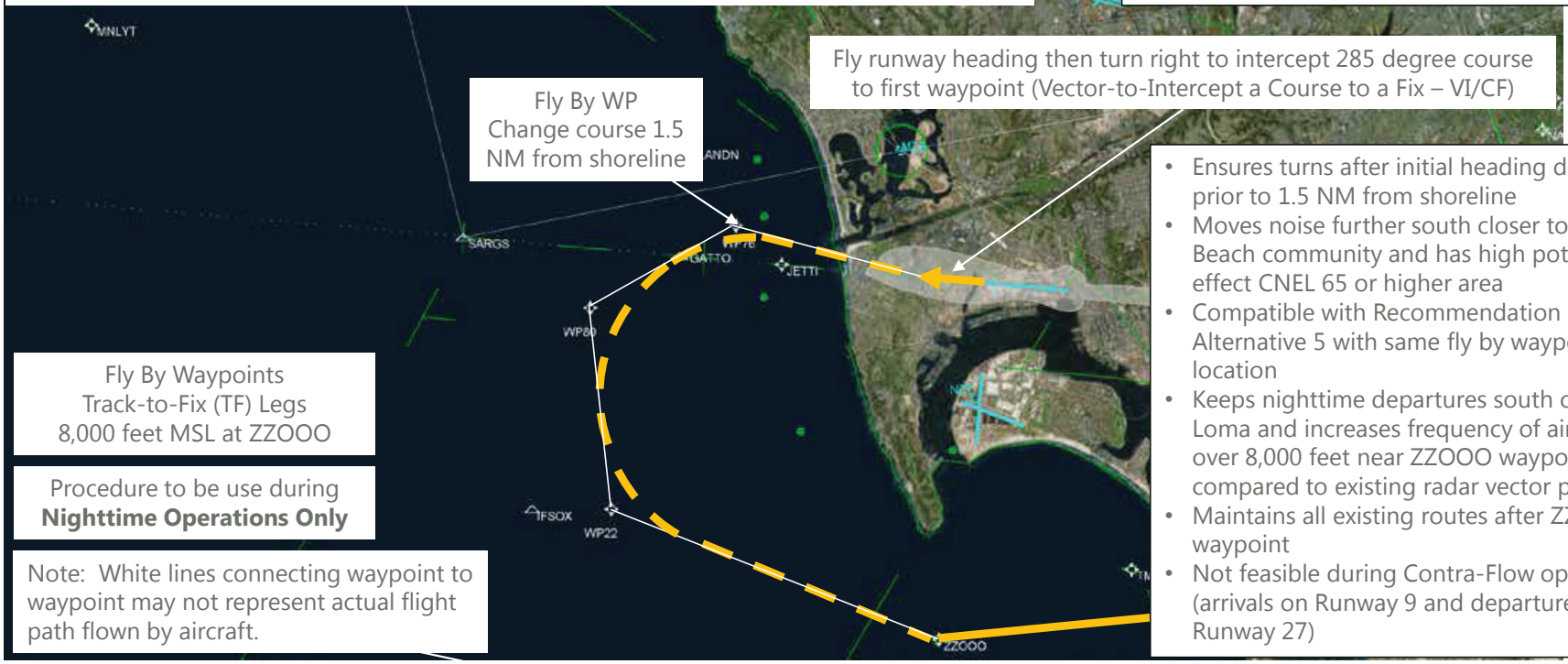
Fly By Waypoint

FAA Order 7110.65X – Divergent Heading for Successive Departures:

- Allows for 10-degree heading from runway end to diverge from aircraft on another heading
- Once lead aircraft is 1 mile away, FAA ATC can release following aircraft as long as heading is 10 degrees or more from lead aircraft
- 10-degree heading only applies from end of departure runway and both departures are on an RNAV procedure, not radar vectored

Recommended Status: Draft-For TAC/CAC Discussion

Modify initial departure heading to direct aircraft on runway heading and then intercept a 285 degree course to the first waypoint located just past 1.5 NM from shoreline



Fly runway heading then turn right to intercept 285 degree course to first waypoint (Vector-to-Intercept a Course to a Fix – VI/CF)

Fly By WP Change course 1.5 NM from shoreline

Fly By Waypoints Track-to-Fix (TF) Legs 8,000 feet MSL at ZZOOO

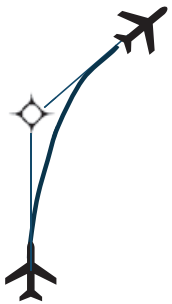
Procedure to be use during **Nighttime Operations Only**

Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

- Ensures turns after initial heading do not occur prior to 1.5 NM from shoreline
- Moves noise further south closer to Ocean Beach community and has high potential to effect CNEL 65 or higher area
- Compatible with Recommendation 14 – Alternative 5 with same fly by waypoint location
- Keeps nighttime departures south of Point Loma and increases frequency of aircraft at or over 8,000 feet near ZZOOO waypoint compared to existing radar vector procedure
- Maintains all existing routes after ZZOOO waypoint
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 5 and Recommendation 15 Alt 5



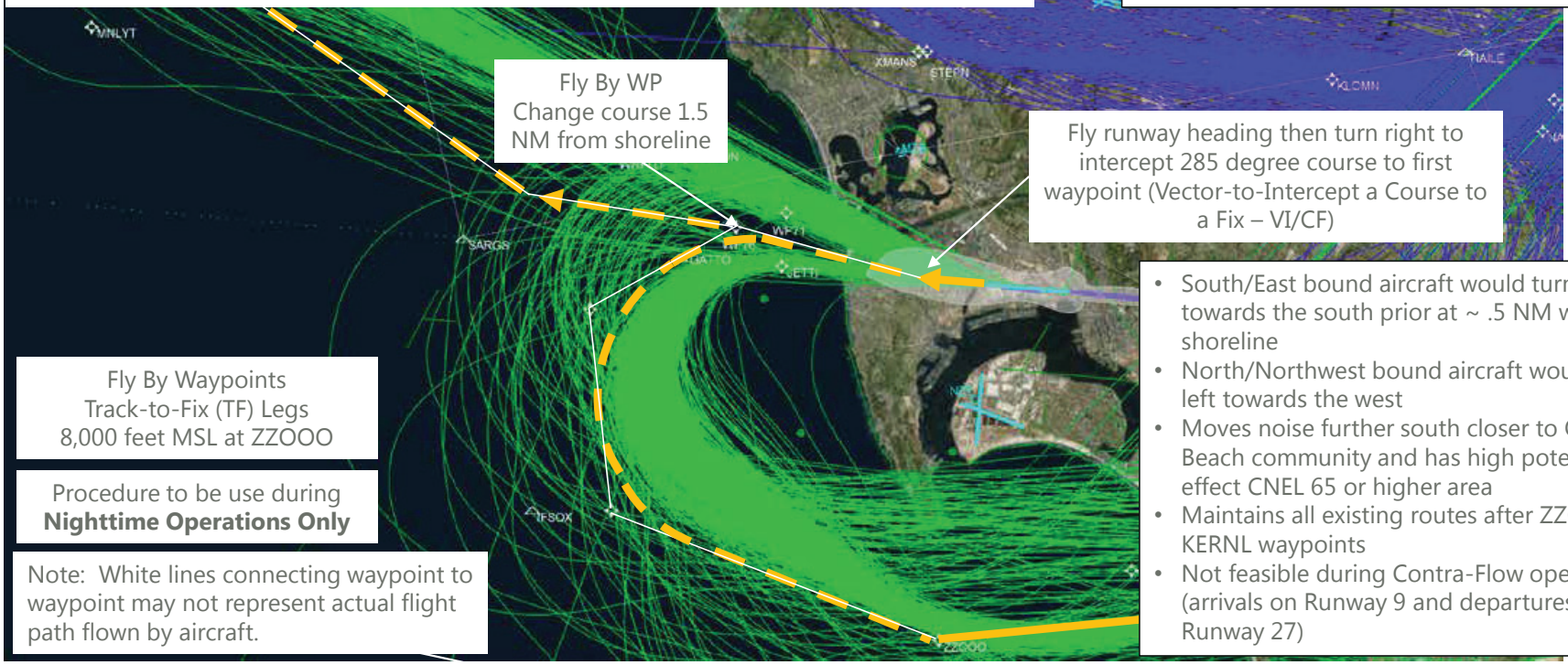
Fly By Waypoint

FAA Order 7110.65X – Divergent Heading for Successive Departures:

- Allows for 10-degree heading from runway end to diverge from aircraft on another heading
- Once lead aircraft is 1 mile away, FAA ATC can release following aircraft as long as heading is 10 degrees or more from lead aircraft
- 10-degree heading only applies from end of departure runway and both departures are on an RNAV procedure, not radar vectored

Recommended Status: Draft-For TAC/CAC Discussion

Modify initial departure heading to direct aircraft on runway heading and then intercept a 285 degree course to the first waypoint located just past 1.5 NM from shoreline



Fly By WP
Change course 1.5 NM from shoreline

Fly runway heading then turn right to intercept 285 degree course to first waypoint (Vector-to-Intercept a Course to a Fix – VI/CF)

- South/East bound aircraft would turn left towards the south prior at ~ .5 NM west of the shoreline
- North/Northwest bound aircraft would turn left towards the west
- Moves noise further south closer to Ocean Beach community and has high potential to effect CNEL 65 or higher area
- Maintains all existing routes after ZZOOO and KERNL waypoints
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Fly By Waypoints
Track-to-Fix (TF) Legs
8,000 feet MSL at ZZOOO

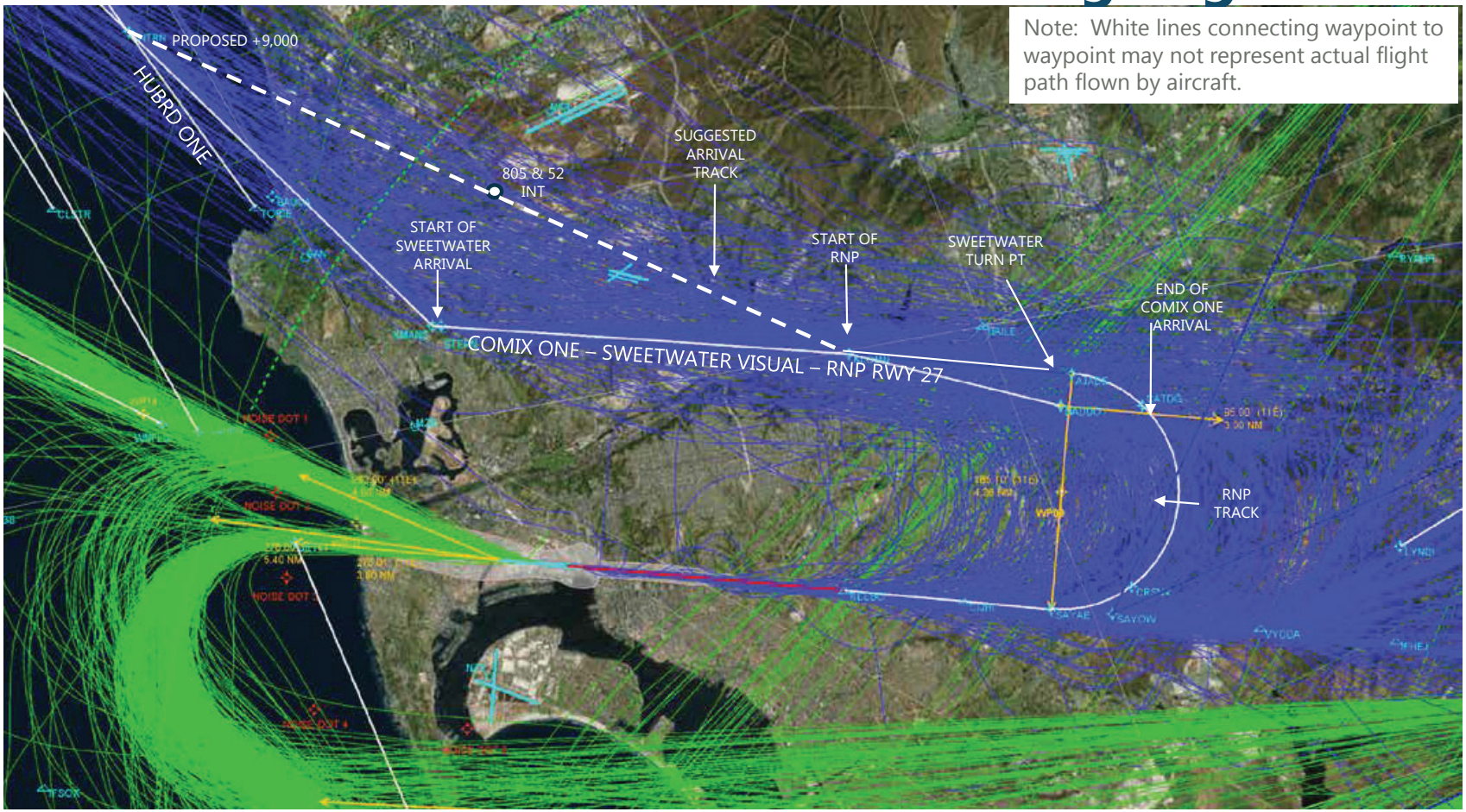
Procedure to be use during **Nighttime Operations Only**

Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

ANAC Noise Recommendation 16 – Reduce Arrival Noise Over La Jolla and East County Communities

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 16 – Existing Flight Tracks



DRAFT Deliberative Document – For Discussion Purposes Only

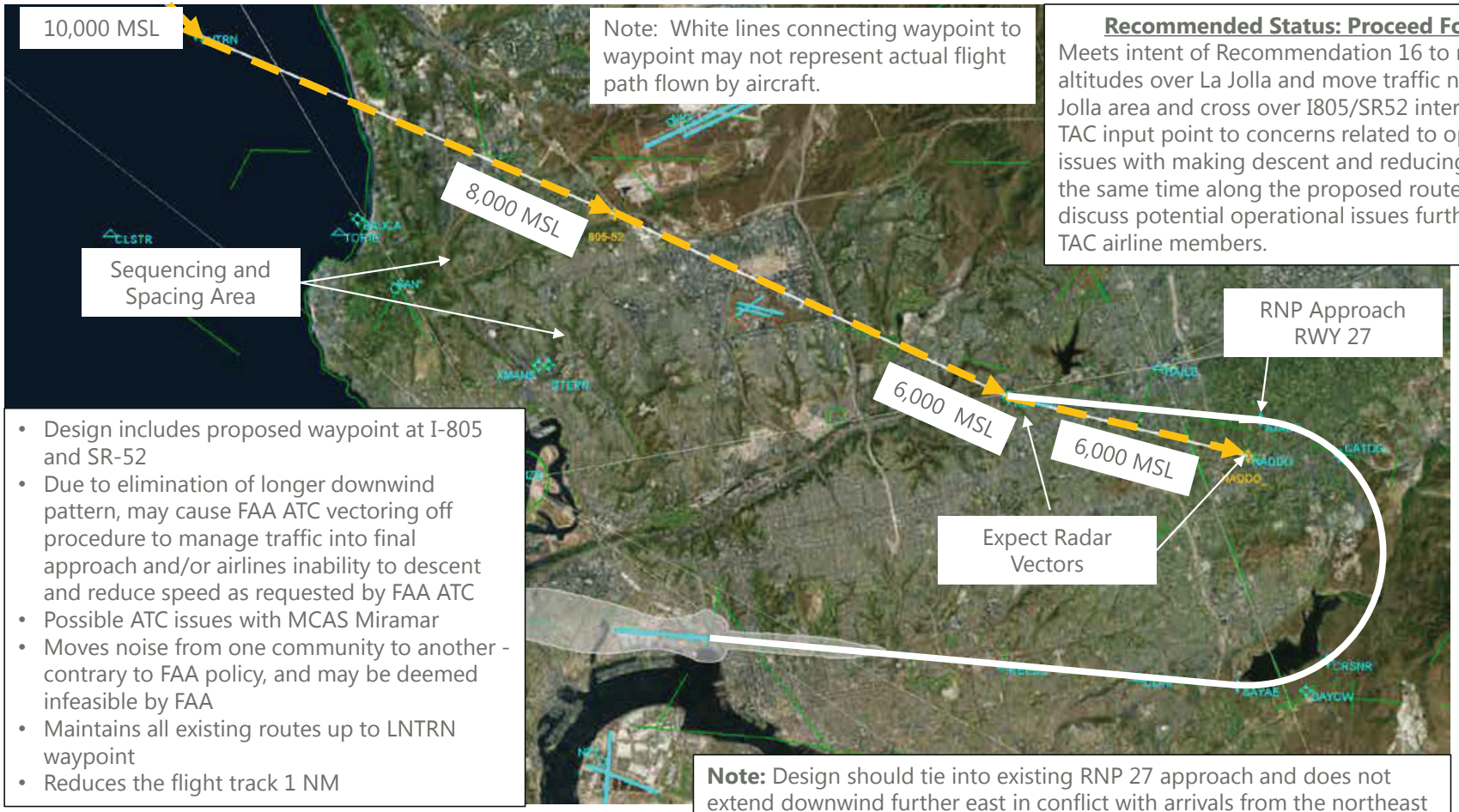
ANAC Noise Recommendation 16 - Alternatives

- **Alternative 1 – Modified COMIX Arrival – LNTRN to I805/SR52 to KLOMN waypoint**
- Alternative 2 – Modified COMIX Arrival – LNTRN to KLOMN waypoint
- Alternative 3 – Modified COMIX Arrival – BAUCA (Over La Jolla Shores Park) to KLOMN waypoint

Note: Item in **bold** is recommended to proceed forward for further assessment

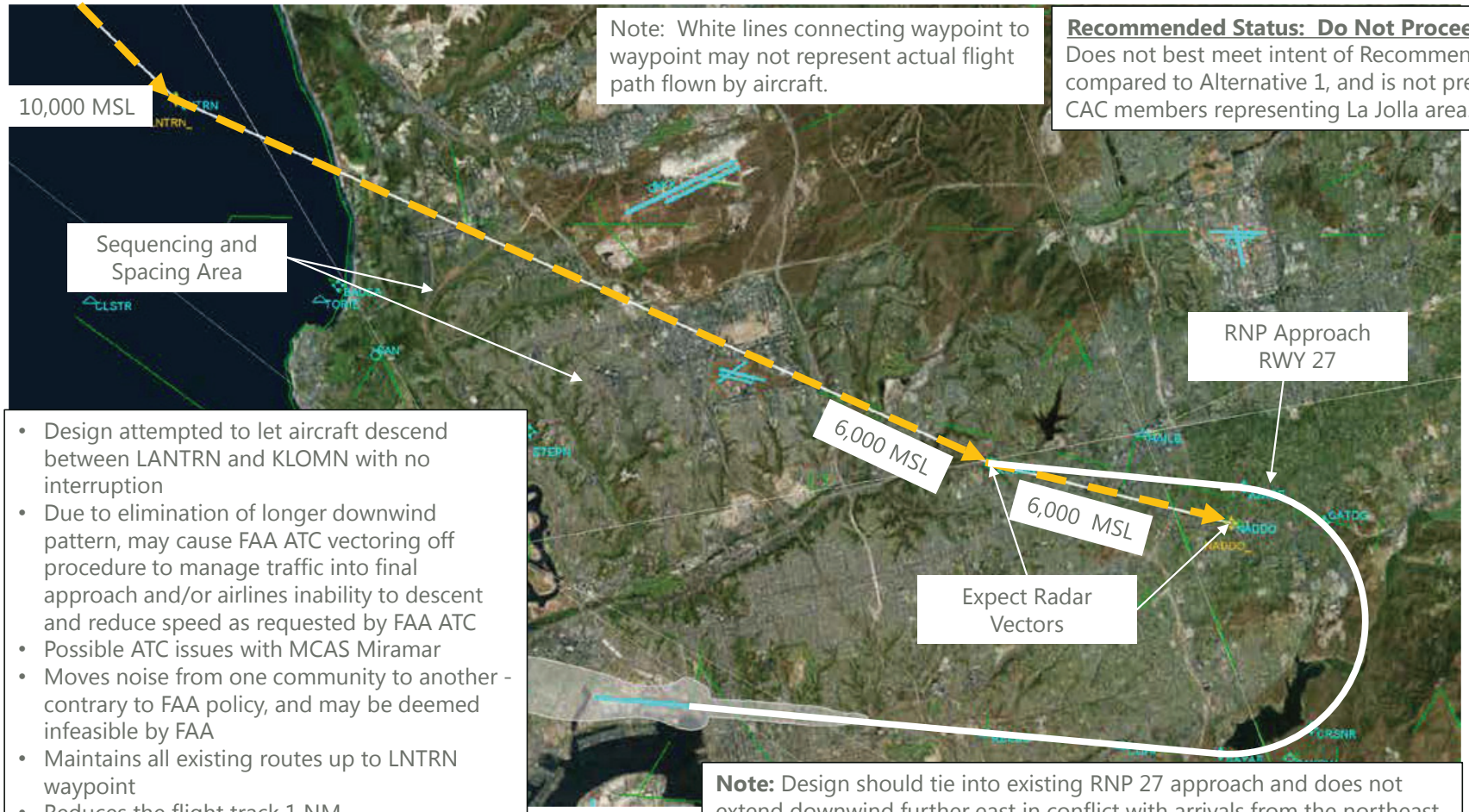
DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 16 – Alt 1



DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 16 – Alt 2



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

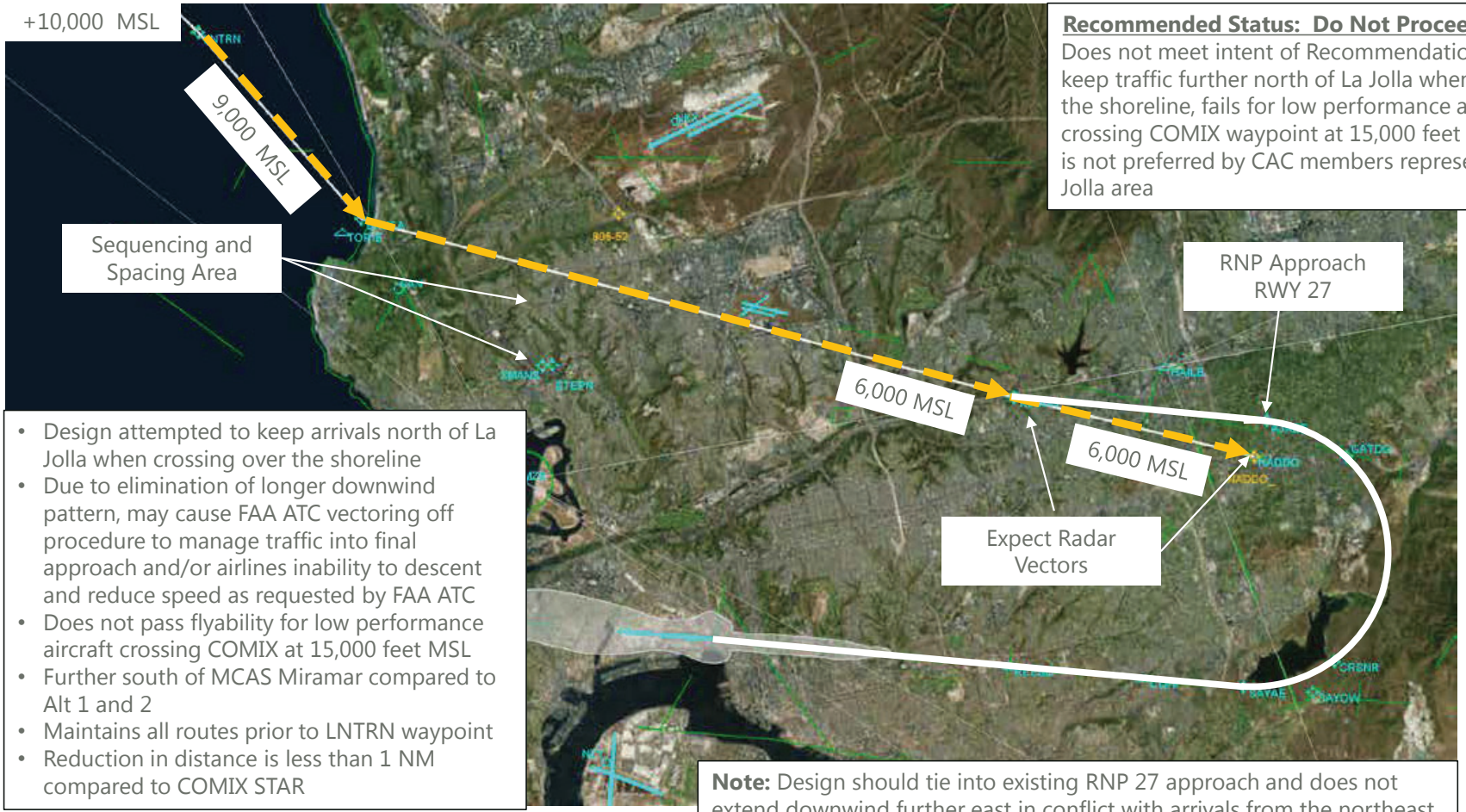
Recommended Status: Do Not Proceed Forward
Does not best meet intent of Recommendation 16 compared to Alternative 1, and is not preferred by CAC members representing La Jolla area.

- Design attempted to let aircraft descend between LANTRN and KLOMN with no interruption
- Due to elimination of longer downwind pattern, may cause FAA ATC vectoring off procedure to manage traffic into final approach and/or airlines inability to descent and reduce speed as requested by FAA ATC
- Possible ATC issues with MCAS Miramar
- Moves noise from one community to another - contrary to FAA policy, and may be deemed infeasible by FAA
- Maintains all existing routes up to LNTRN waypoint
- Reduces the flight track 1 NM

Note: Design should tie into existing RNP 27 approach and does not extend downwind further east in conflict with arrivals from the northeast

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 16 – Alt 3



Recommended Status: Do Not Proceed Forward

Does not meet intent of Recommendation 16 to keep traffic further north of La Jolla when crossing the shoreline, fails for low performance aircraft crossing COMIX waypoint at 15,000 feet MSL, and is not preferred by CAC members representing La Jolla area

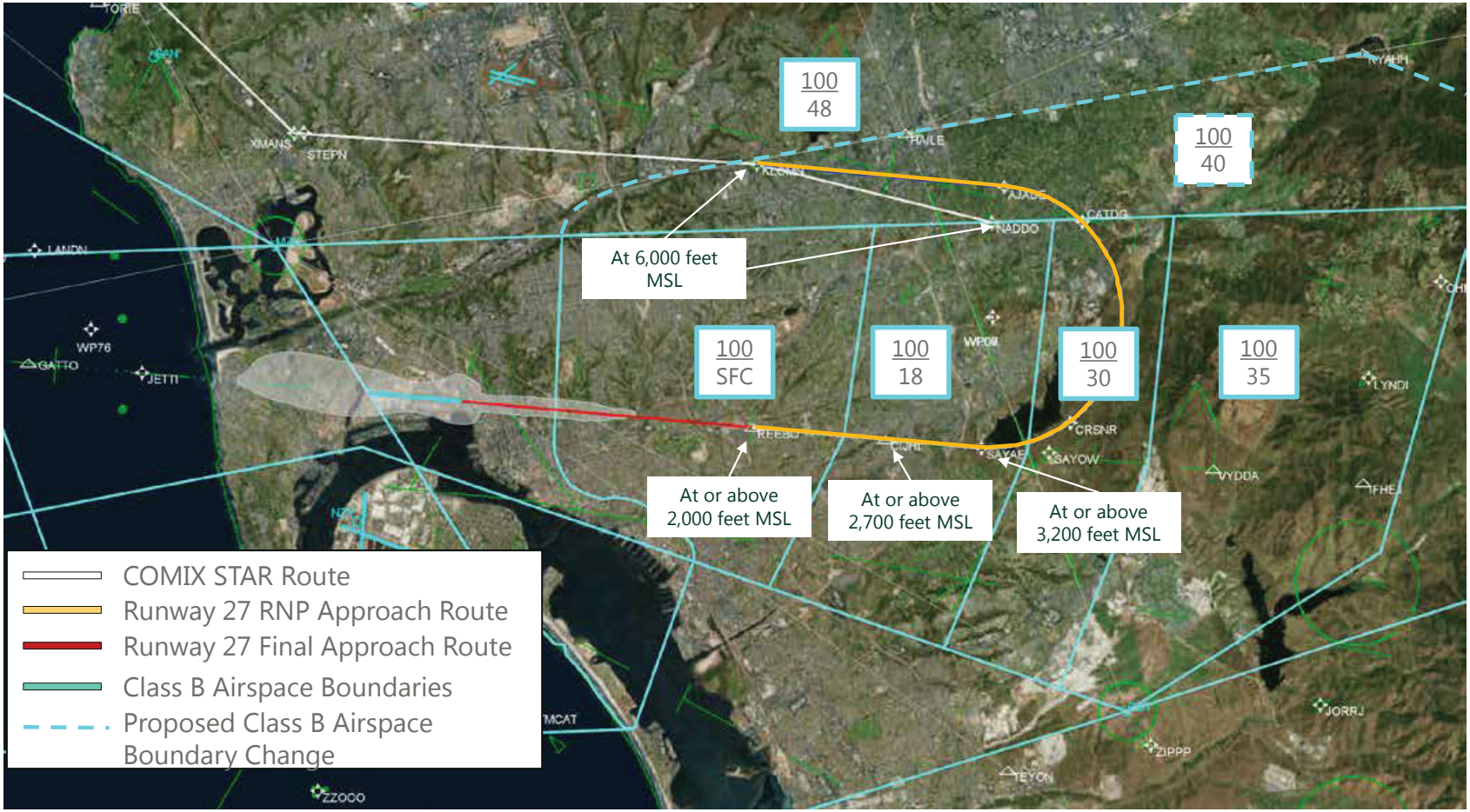
- Design attempted to keep arrivals north of La Jolla when crossing over the shoreline
- Due to elimination of longer downwind pattern, may cause FAA ATC vectoring off procedure to manage traffic into final approach and/or airlines inability to descent and reduce speed as requested by FAA ATC
- Does not pass flyability for low performance aircraft crossing COMIX at 15,000 feet MSL
- Further south of MCAS Miramar compared to Alt 1 and 2
- Maintains all routes prior to LNTRN waypoint
- Reduction in distance is less than 1 NM compared to COMIX STAR

Note: Design should tie into existing RNP 27 approach and does not extend downwind further east in conflict with arrivals from the northeast

East County SDIA Arrival from Northwest

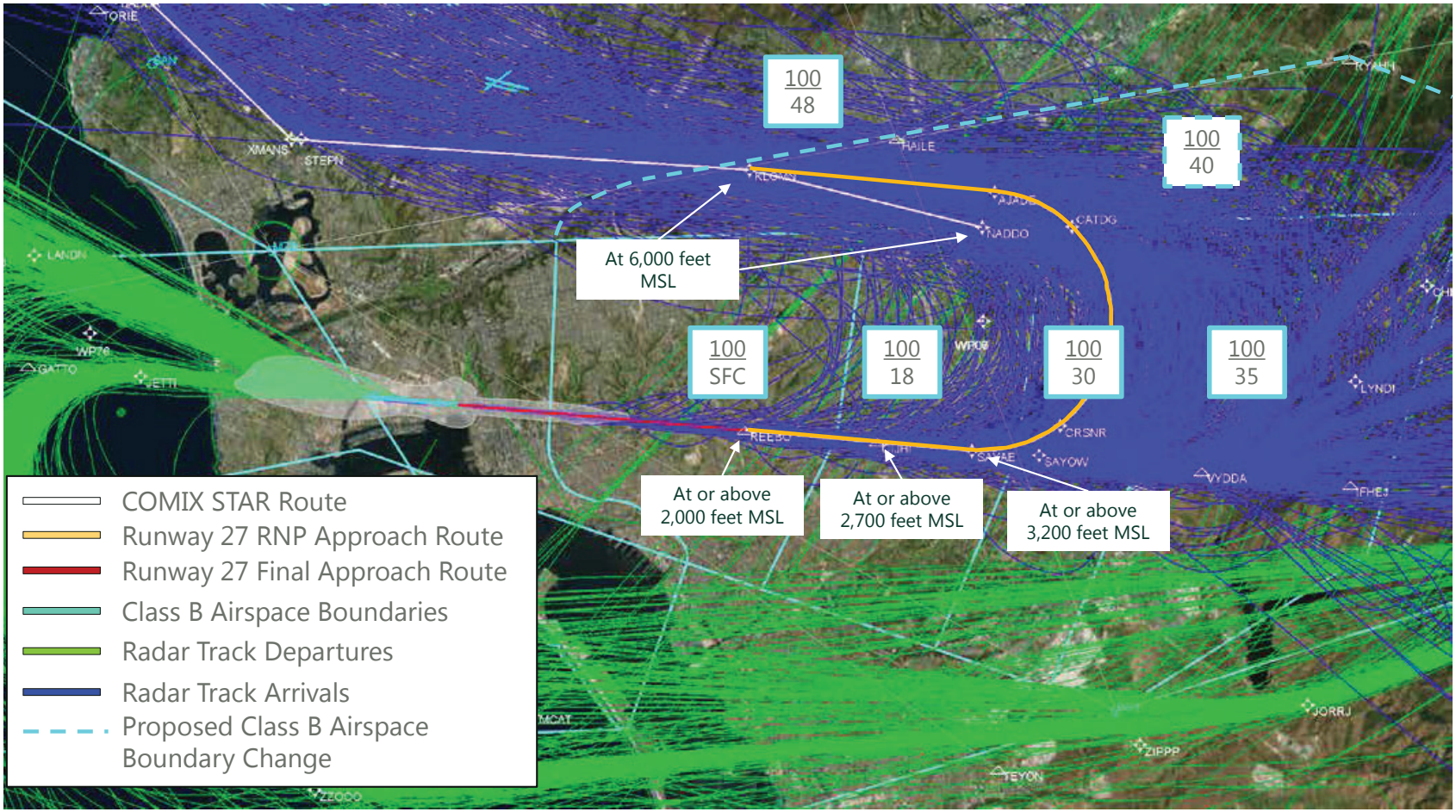
DRAFT Deliberative Document – For Discussion Purposes Only

East County SAN Northwest Arrivals – Procedures and Class B Airspace



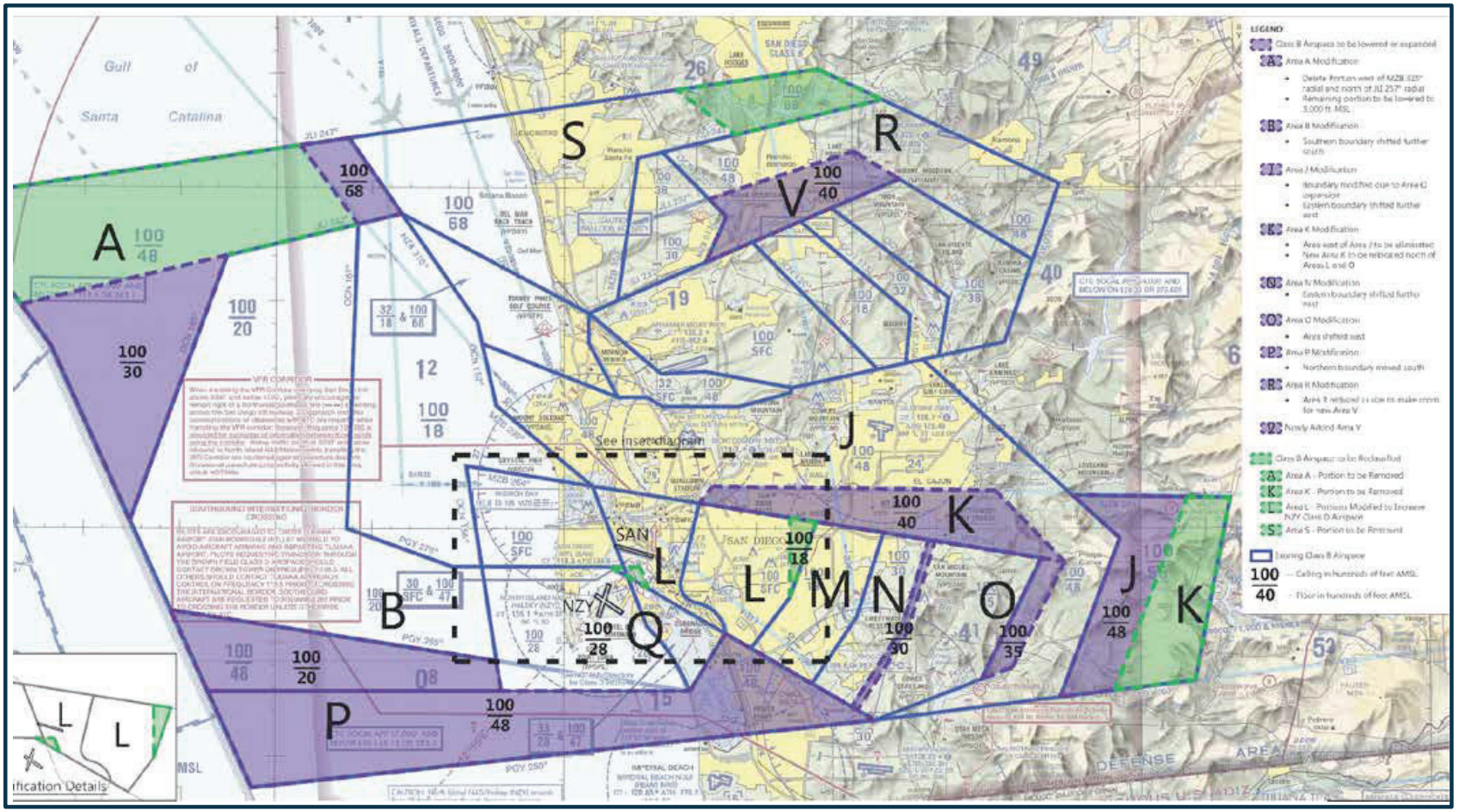
DRAFT Deliberative Document – For Discussion Purposes Only

East County SDIA Northwest Arrivals Slide – West Flow Flight Patterns



DRAFT Deliberative Document – For Discussion Purposes Only

East County Arrivals Slide – Class B Airspace Redesign



Next Steps – Action Items and Next TAC Meeting

DRAFT Deliberative Document – For Discussion Purposes Only

Next Steps

- Input period open until September 13, 2018
- Review input provided by TAC and CAC members
- Recommend design concept refinements for Final Phase concept design
- Begin aircraft noise screening on Final Phase designs proceeding forward
- Present recommendations on Final Phase designs on October 11th CAC and TAC meeting
- Present aircraft noise screening results on all Final Phase designs by late November/early December

B.1.6 CAC AND TAC MEETING #4 – OCTOBER 25, 2018

RICONDO®

San Diego County Regional Airport Authority (SDCRAA)
Flight Procedure Evaluation
Technical Advisory Committee and Citizen Advisory Committee Meeting #4

San Diego International Airport

October 25, 2018

DRAFT Deliberative Document – For Discussion Purposes Only

DRAFT Deliberative Document – For Discussion Purposes Only

Agenda

- Meeting Goals
- Daytime Departure Final Concept Design
- Nighttime Departure Final Concept Designs
- Daytime/Nighttime Arrival Final Concept Design

DRAFT Deliberative Document – For Discussion Purposes Only

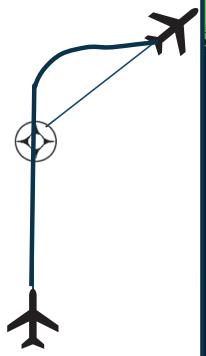
Meeting Goals

- Review final design concepts for noise screening analysis
- Discuss clarifications to comments and responses

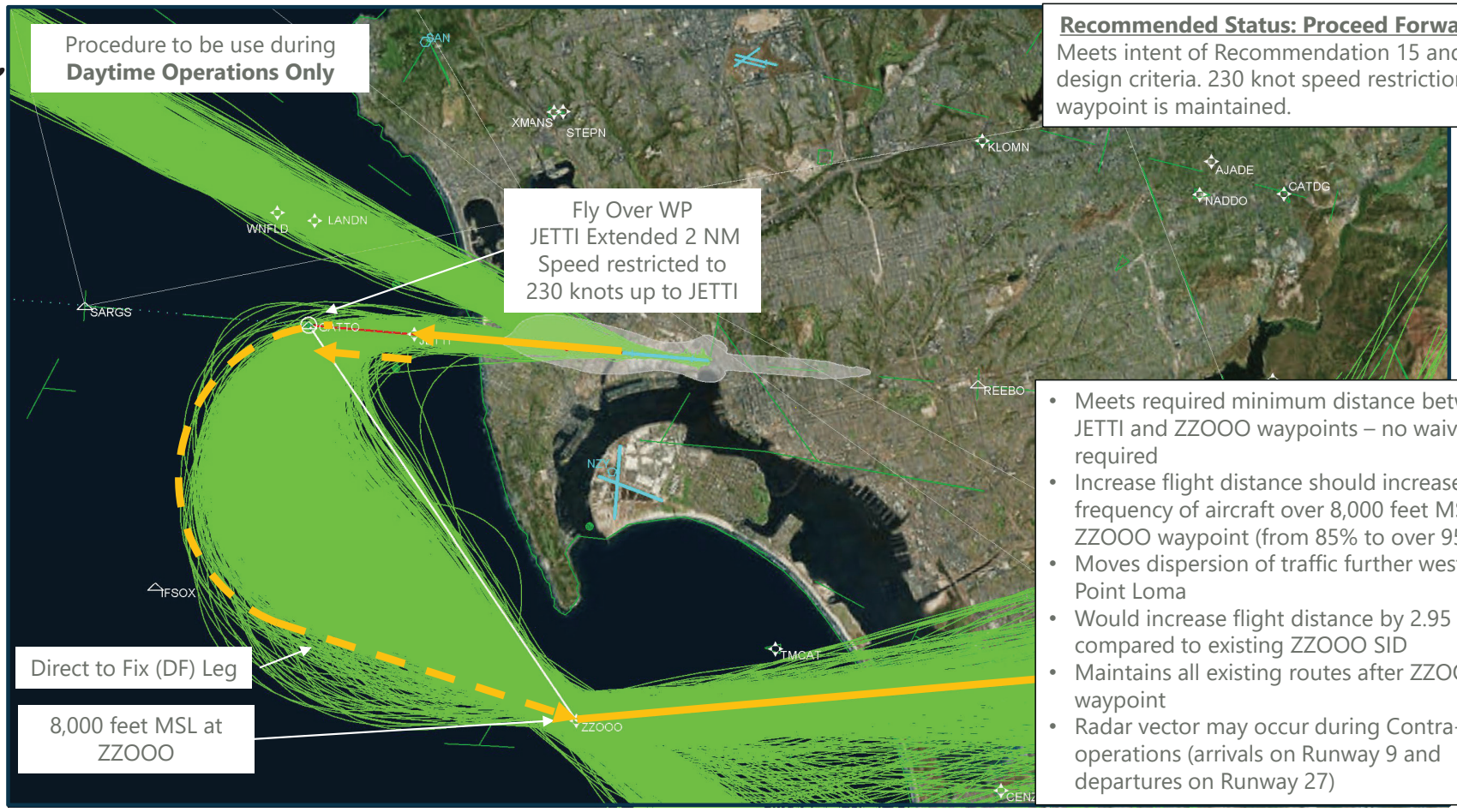
Daytime Departures

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Alt 1 Extend JETTI Waypoint 2 NM West



Fly Over Waypoint



Recommended Status: Proceed Forward to Final

Meets intent of Recommendation 15 and meets design criteria. 230 knot speed restriction to JETTI waypoint is maintained.

- Meets required minimum distance between JETTI and ZZOOO waypoints – no waiver required
- Increase flight distance should increase frequency of aircraft over 8,000 feet MSL near ZZOOO waypoint (from 85% to over 95%)
- Moves dispersion of traffic further west from Point Loma
- Would increase flight distance by 2.95 NM compared to existing ZZOOO SID
- Maintains all existing routes after ZZOOO waypoint
- Radar vector may occur during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Nighttime Departures

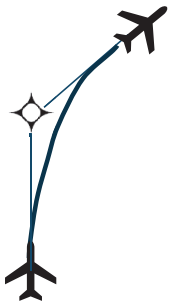
DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 1 "Fly By" Version 2 and Recommendation 15 Alt 2 Version 2

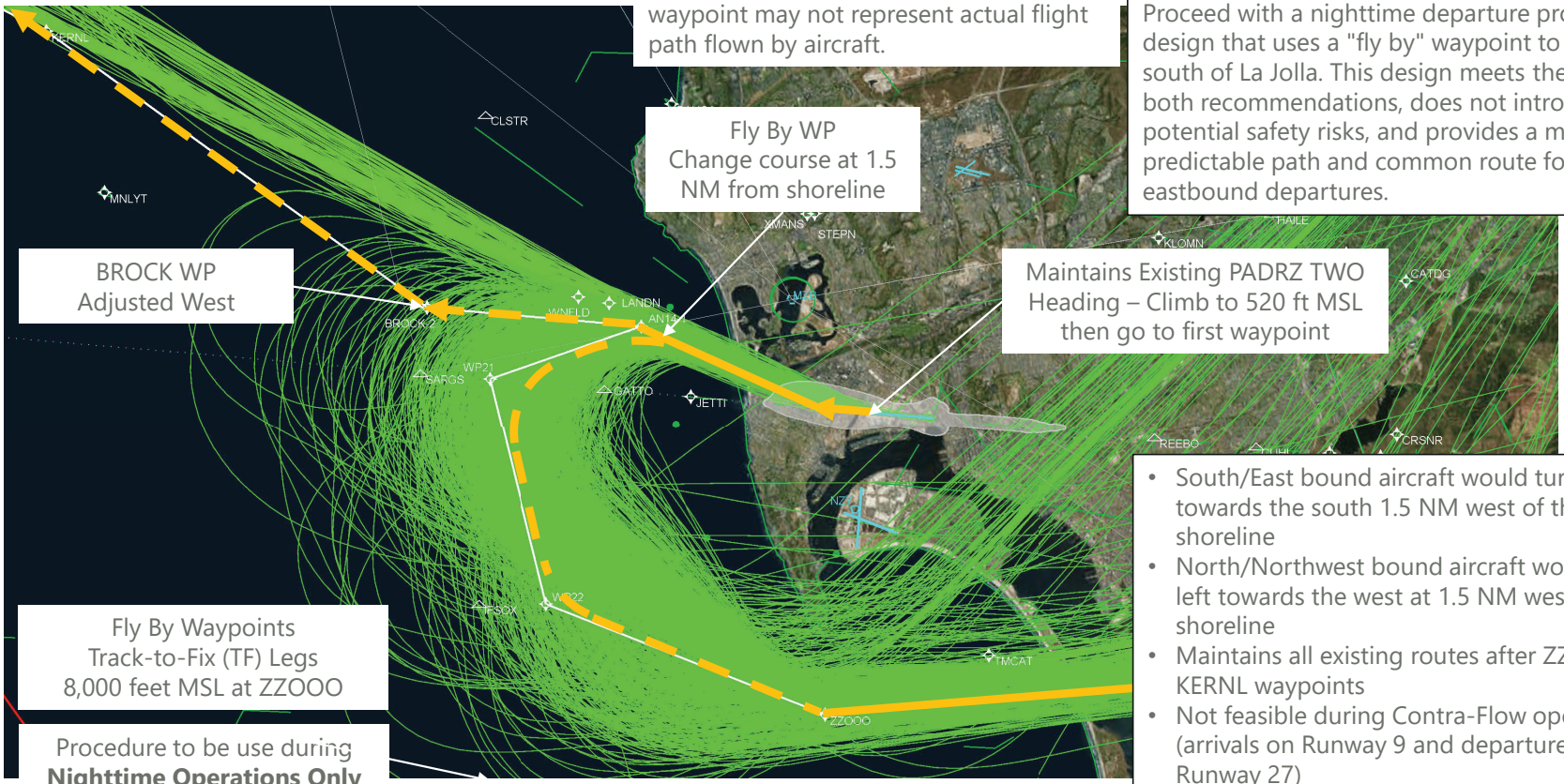
Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Proceed Forward to Final

Proceed with a nighttime departure procedure design that uses a "fly by" waypoint to stay further south of La Jolla. This design meets the intent for both recommendations, does not introduce potential safety risks, and provides a more predictable path and common route for north and eastbound departures.



Fly By Waypoint



Fly By WP
Change course at 1.5 NM from shoreline

BROCK WP
Adjusted West

Maintains Existing PADRZ TWO Heading – Climb to 520 ft MSL then go to first waypoint

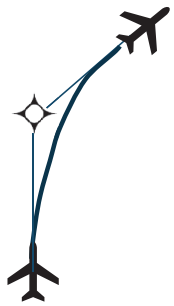
Fly By Waypoints
Track-to-Fix (TF) Legs
8,000 feet MSL at ZZOOO

Procedure to be use during **Nighttime Operations Only**

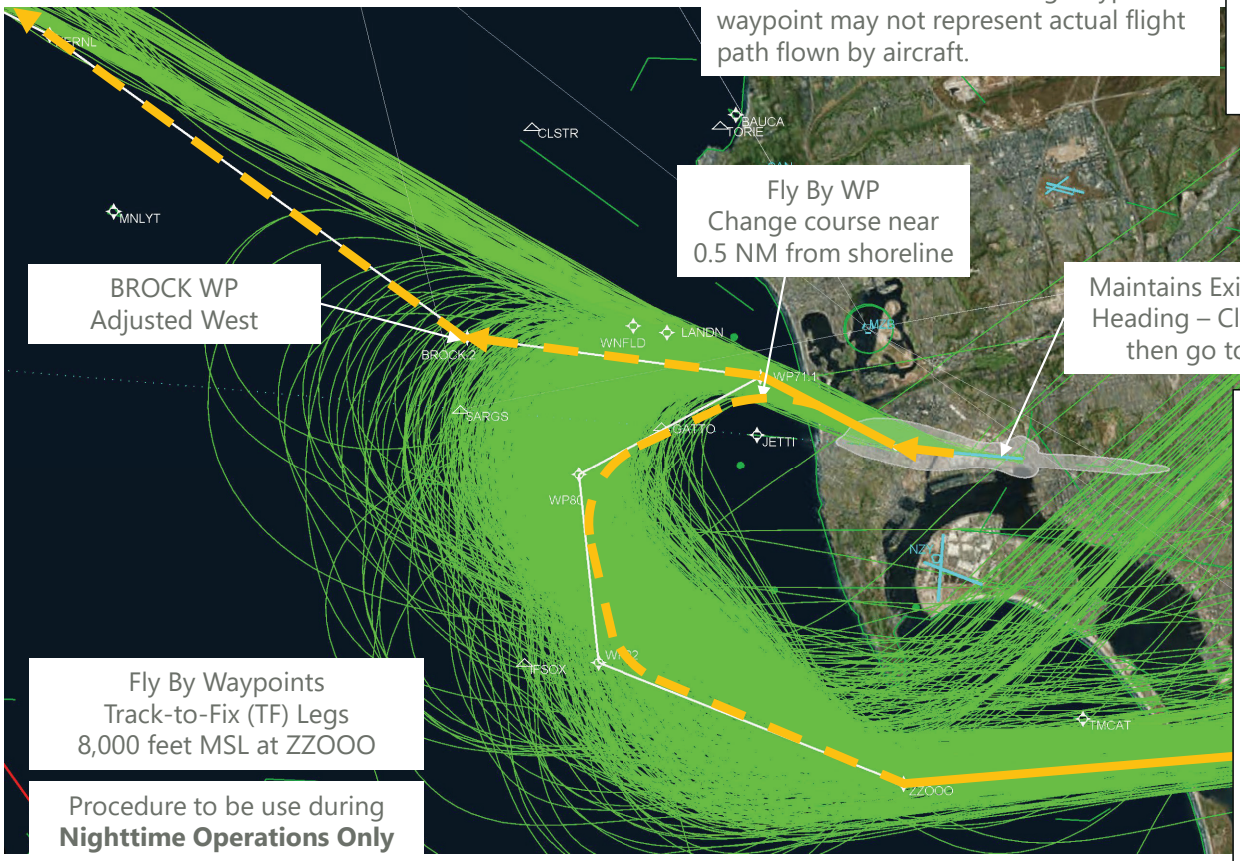
- South/East bound aircraft would turn left towards the south 1.5 NM west of the shoreline
- North/Northwest bound aircraft would turn left towards the west at 1.5 NM west of the shoreline
- Maintains all existing routes after ZZOOO and KERNL waypoints
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 4 and Recommendation 15 Alt 4



Fly By Waypoint



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Proceed Forward to Final
Refined concept where aircraft may turn west as soon as possible while maintaining the existing PADRZ SID initial departure path from Runway 27

Fly By WP
Change course near 0.5 NM from shoreline

BROCK WP
Adjusted West

Maintains Existing PADRZ TWO Heading – Climb to 520 ft MSL then go to first waypoint

Fly By Waypoints
Track-to-Fix (TF) Legs
8,000 feet MSL at ZZOOO

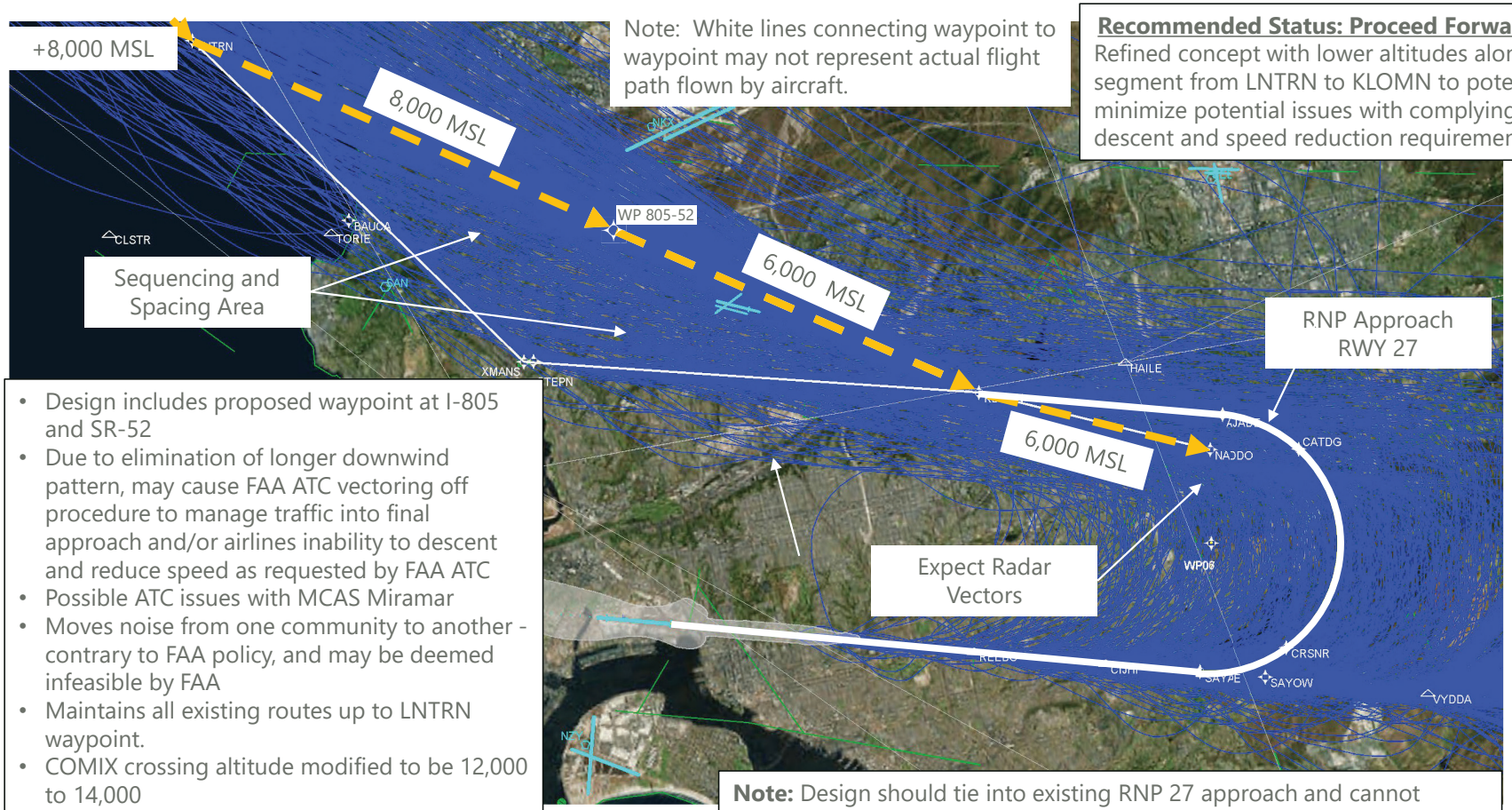
Procedure to be use during **Nighttime Operations Only**

- South/East bound aircraft would turn left towards the south prior at ~ .5 NM west of the shoreline
- North/Northwest bound aircraft would turn left towards the west prior at ~ .5 NM west of the shoreline
- Expected to increase frequency of aircraft at or above 8,000 feet MSL near ZZOOO waypoint, but not as much as Recommendation 15 Alternative 2 due to shorter distance
- Maintains all existing routes after ZZOOO and KERNL waypoints
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Daytime/Nighttime Arrivals

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 16 – Alt 1 Version 3



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Proceed Forward to Final

Refined concept with lower altitudes along straight segment from LNTRN to KLOMN to potentially minimize potential issues with complying with descent and speed reduction requirements.

- Design includes proposed waypoint at I-805 and SR-52
- Due to elimination of longer downwind pattern, may cause FAA ATC vectoring off procedure to manage traffic into final approach and/or airlines inability to descent and reduce speed as requested by FAA ATC
- Possible ATC issues with MCAS Miramar
- Moves noise from one community to another - contrary to FAA policy, and may be deemed infeasible by FAA
- Maintains all existing routes up to LNTRN waypoint.
- COMIX crossing altitude modified to be 12,000 to 14,000
- Reduces the flight track 1 NM

Note: Design should tie into existing RNP 27 approach and cannot extend downwind further east in conflict with arrivals from the northeast

DRAFT Deliberative Document – For Discussion Purposes Only

Next Steps

- Conduct noise screening analysis

B.1.7 CAC AND TAC MEETING #5 – MARCH 28, 2019

RICONDO®

San Diego County Regional Airport Authority (SDCRAA)
Flight Procedure Evaluation
Technical Advisory Committee and Citizen Advisory Committee Meeting #5

San Diego International Airport

March 28, 2019

DRAFT Deliberative Document – For Discussion Purposes Only

DRAFT Deliberative Document – For Discussion Purposes Only

Agenda

- Meeting Goals
- Noise Screening Methodology
- Nighttime Departure Final Concept Designs
- Daytime Departure Final Concept Design
- Daytime/Nighttime Arrival Final Concept Design

DRAFT Deliberative Document – For Discussion Purposes Only

Meeting Goals

- Understand noise screening methodology
- Review noise screening results of final design concepts
- Gather input on recommendations

DRAFT Deliberative Document – For Discussion Purposes Only

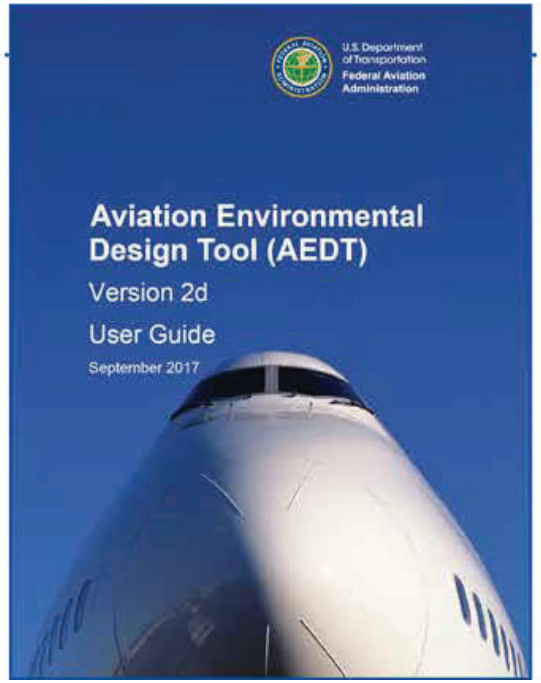
Noise Screening Methodology - AEDT

- FAA Aviation Environmental Design Tool (AEDT) 2d noise model

INPUT

PHYSICAL
For example:
- Runway layouts
- Airfield elevation
- Atmospheric conditions
- Flight tracks

OPERATIONAL
For example:
- Aircraft types
- Aircraft operation numbers
- Airport use by runway
- Flight track



OUTPUT
- Noise exposure contours
- Location-specific detailed reports
- Emissions and fuel consumption

Noise Screening

- **Intent:** Identify and estimate potential decrease or increase in noise caused by implementing a proposed concept RNAV design procedure
- **Approach:** Capture primary jet aircraft noise source from SDIA over community areas where proposed concepts are designed to reduce noise
- **Application:** Provide indications of potential changes in CNEL related to jet traffic subject to change as a result of a proposed concept.

Note: Results do not reflect the cumulative average annual day flight patterns and operations at SDIA; therefore not intended to represent overall existing noise exposure levels

DRAFT Deliberative Document – For Discussion Purposes Only

Noise Screening Methodology - Baseline

- **Source:** Authority's Airport Noise and Operations Management System (ANOMS) flight operations and radar track data: May 2017 to December 2017
- **Operation focus:** Jet departures from Runway 27 and jet arrivals from northwest to Runway 27
- **Traffic flow focus:**
  - Northbound departures (e.g., PADRZ RNAV SID, CWARD RNAV SID, PEBLE SID and FAA ATC radar vectoring)
  - Eastbound departures (e.g., ZZOOO RNAV SID, BORDER SID, and FAA ATC radar vectoring)
  - Arrivals from northwest (e.g., COMIX RNAV STAR, HUBRD STAR and FAA ATC radar vectoring)

DRAFT Deliberative Document – For Discussion Purposes Only

Noise Screening Methodology - Alternative

- **Modify** baseline RNAV noise model tracks to represent proposed final design flight path
- **Move** baseline RNAV operations to alternative RNAV noise model track
- **Maintain** non-RNAV noise model tracks and operations on tracks
- **Compare** CNEL values between Baseline and Alternative scenarios

Modeled Scenarios

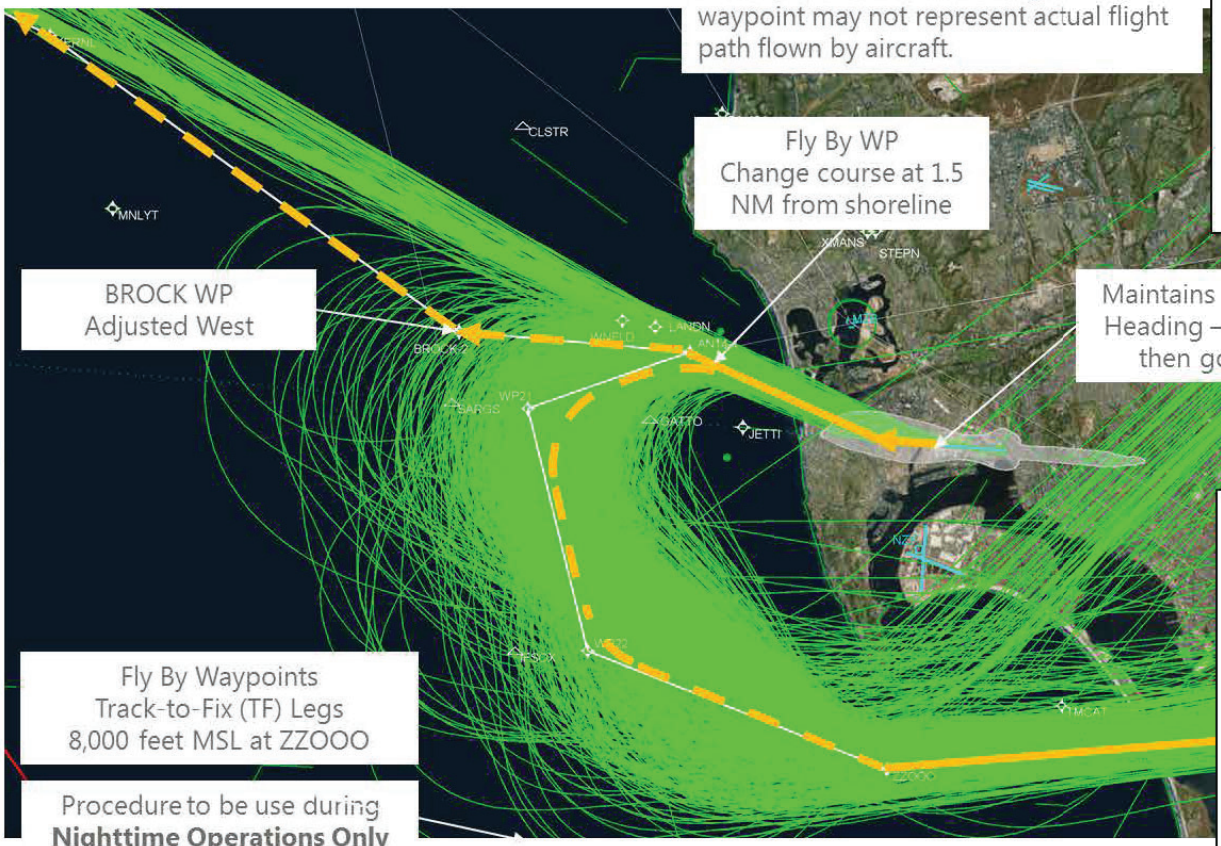
- **Scenario 1:** Recommendation 14 Alt 1 "Fly By" Version 2 and Recommendation 15 Alt 2 Version 2 (Nighttime Departures)
- **Scenario 2:** Recommendation 14 Alt 4 and Recommendation 15 Alt 4 (Nighttime Departures)
- **Scenario 3:** Recommendation 15 – Alt 1 Extend JETTI Waypoint 2 NM West (Daytime Departures)
- **Scenario 4:** Recommendation 16 – Alt 1 Version 3 (Daytime/Nighttime Arrivals)
- All scenarios include primary jet daytime, evening and nighttime operations and flight patterns over focused community areas
- Scenarios do not represent cumulative average annual day noise exposure levels

Nighttime Departures

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 1 "Fly By" Version 2 and Recommendation 15 Alt 2 Version 2 – Final Design

Fly By Waypoint



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Fly By WP
Change course at 1.5 NM from shoreline

BROCK WP
Adjusted West

Maintains Existing PADRZ TWO Heading – Climb to 520 ft MSL then go to first waypoint

Fly By Waypoints
Track-to-Fix (TF) Legs
8,000 feet MSL at ZZOOO

Procedure to be use during **Nighttime Operations Only**

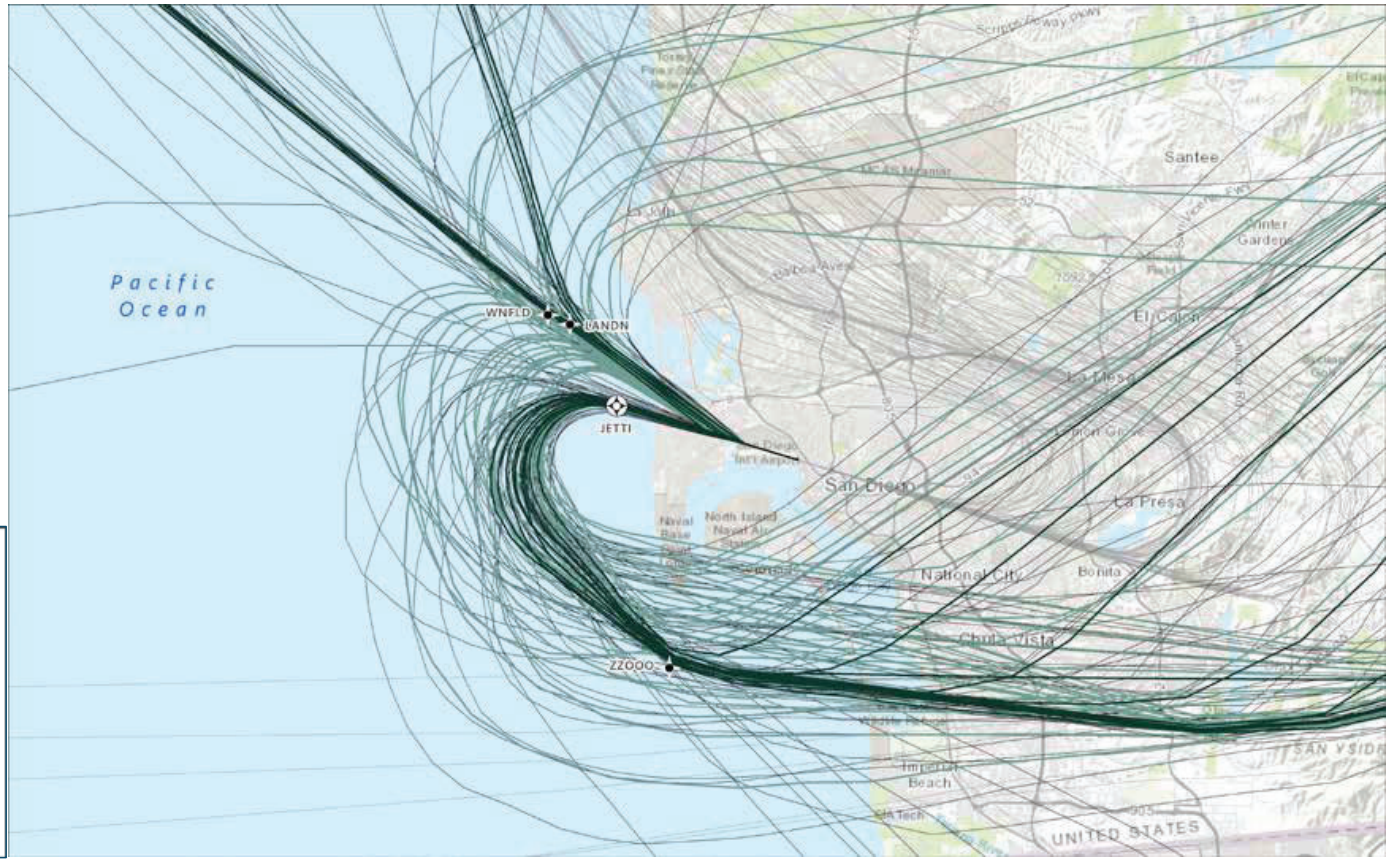
Recommended Status: Proceed Forward to Final

Proceed with a nighttime departure procedure design that uses a "fly by" waypoint to stay further south of La Jolla. This design meets the intent for both recommendations, does not introduce potential safety risks, and provides a more predictable path and common route for north and eastbound departures.

- South/East bound aircraft would turn left towards the south 1.5 NM west of the shoreline
- North/Northwest bound aircraft would turn left towards the west at 1.5 NM west of the shoreline
- Maintains all existing routes after ZZOOO and KERNL waypoints
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 1 "Fly By" Version 2 and Recommendation 15 Alt 2 Version 2 – AEDT Baseline Noise Model Tracks



LEGEND

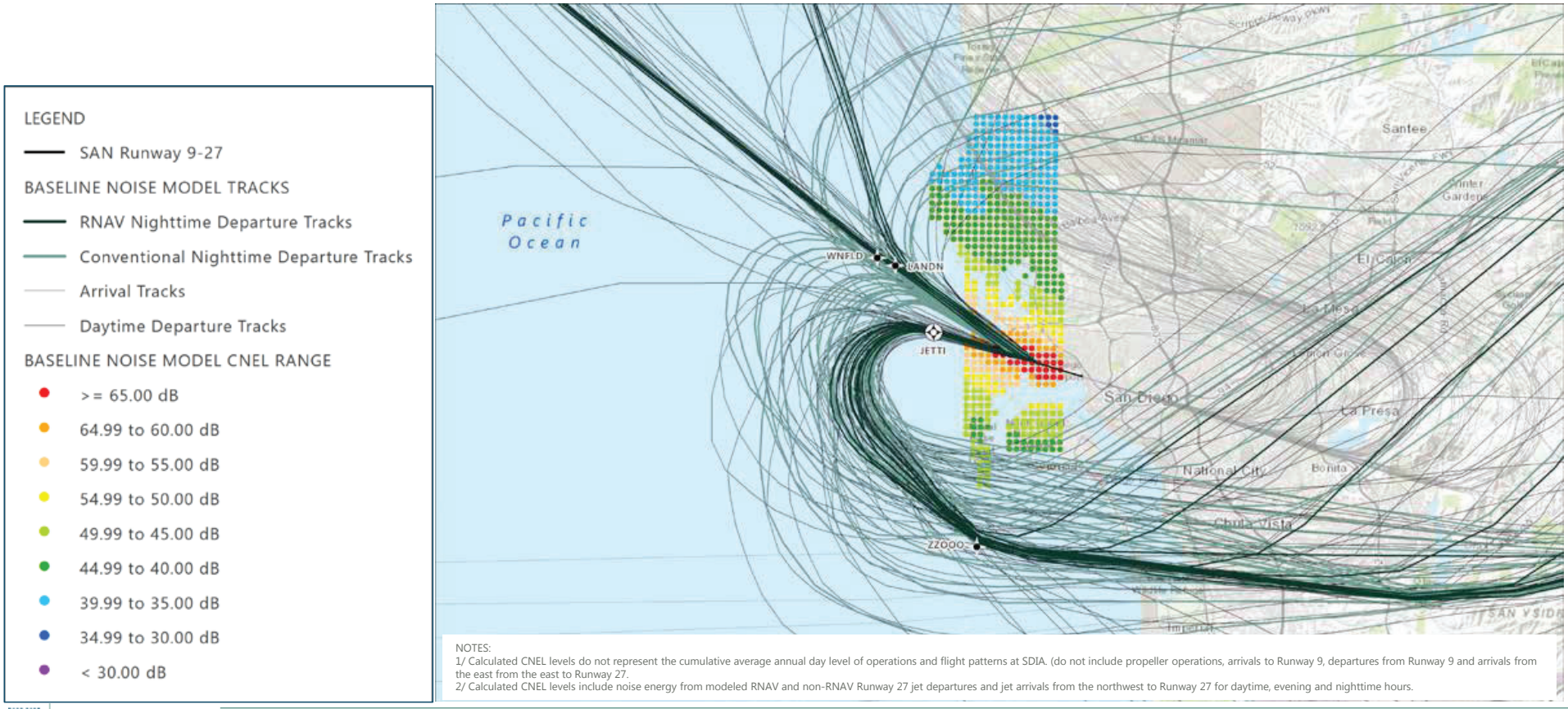
SAN Runway 9-27

BASELINE NOISE MODEL TRACKS

- RNAV Nighttime Departure Tracks
- Conventional Nighttime Departure Tracks
- Arrival Tracks
- Daytime Departure Tracks

DRAFT Deliberative Document – For Discussion Purposes Only

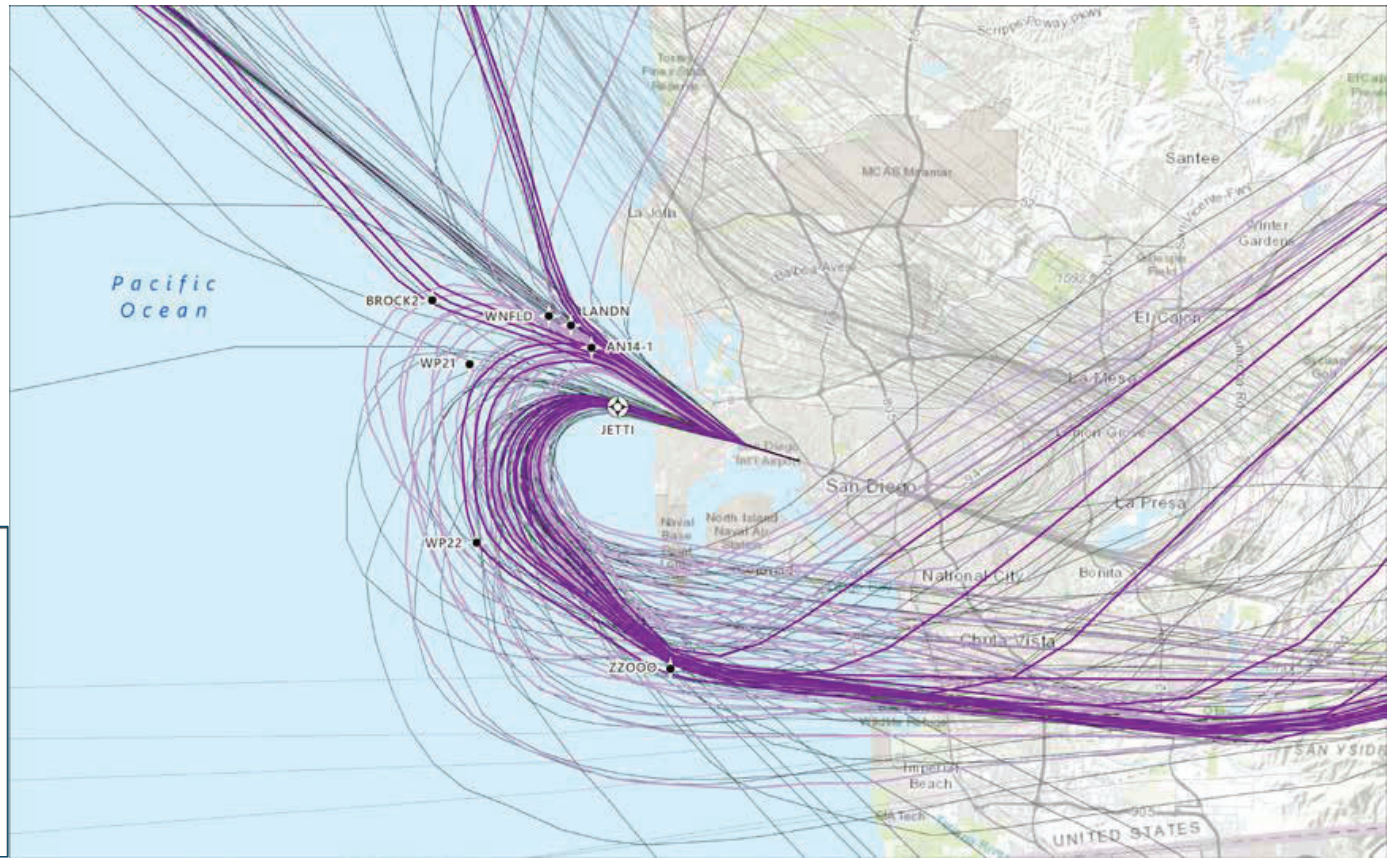
Composite of Recommendation 14 Alt 1 "Fly By" Version 2 and Recommendation 15 Alt 2 Version 2 – AEDT Baseline Noise Model Tracks and CNEL Ranges



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 1 "Fly By" Version 2 and Recommendation 15 Alt 2 Version 2 – AEDT Scenario 1 Noise Model Tracks



DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 1 "Fly By" Version 2 and Recommendation 15 Alt 2 Version 2 – AEDT Scenario 1 Noise Model Tracks and CNEL Ranges

LEGEND

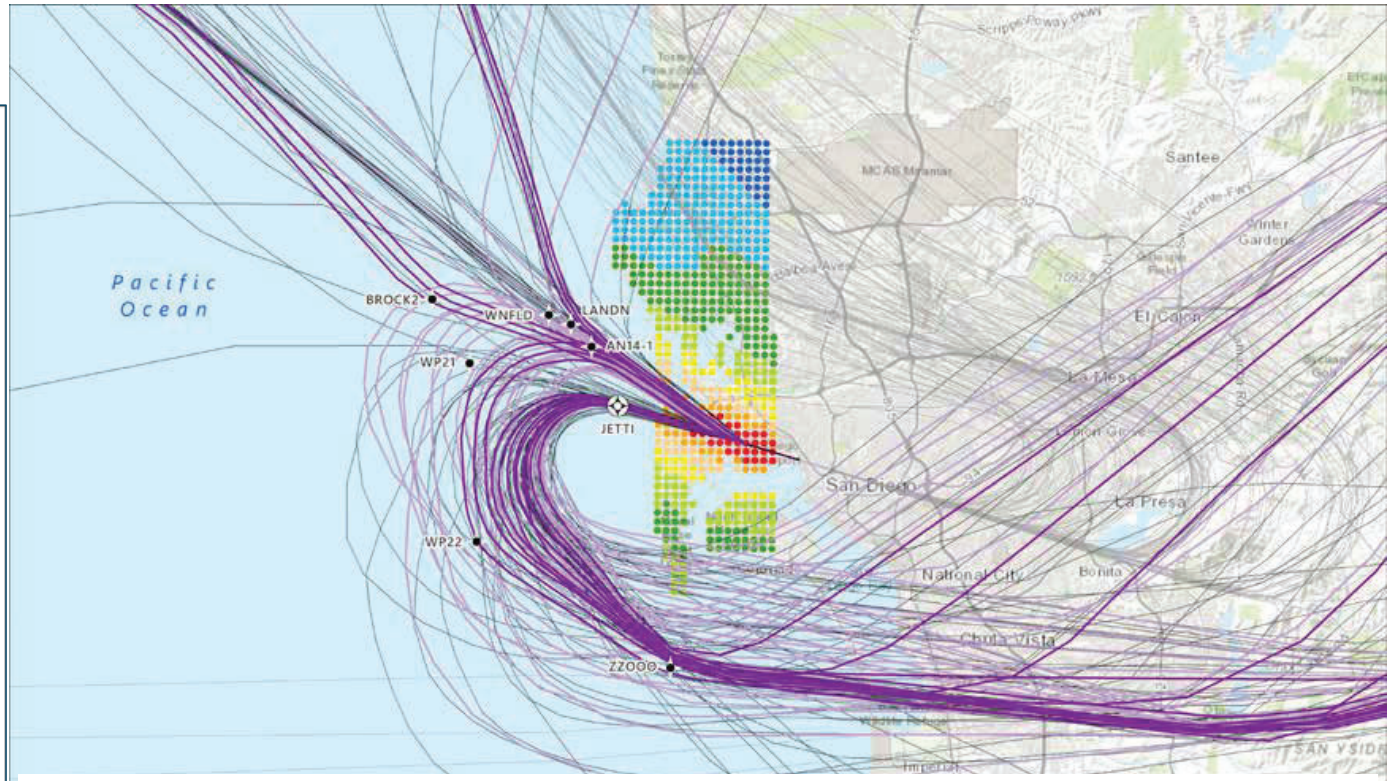
- SAN Runway 9-27

SCENARIO 1 NOISE MODEL TRACKS

- RNAV Nighttime Departure Tracks
- Conventional Nighttime Departure Tracks
- Arrival Tracks
- Daytime Departure Tracks

SCENARIO 1 CNEL RANGE

- >= 65.00 dB
- 64.99 to 60.00 dB
- 59.99 to 55.00 dB
- 54.99 to 50.00 dB
- 49.99 to 45.00 dB
- 44.99 to 40.00 dB
- 39.99 to 35.00 dB
- 34.99 to 30.00 dB
- < 30.00 dB



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 1 "Fly By" Version 2 and Recommendation 15 Alt 2 Version 2 – AEDT Scenario 1/Baseline Noise Model Tracks and CNEL Changes

LEGEND

SAN Runway 9-27

BASELINE NOISE MODEL TRACKS

RNAV Nighttime Departure Tracks

Conventional Nighttime Departure Tracks

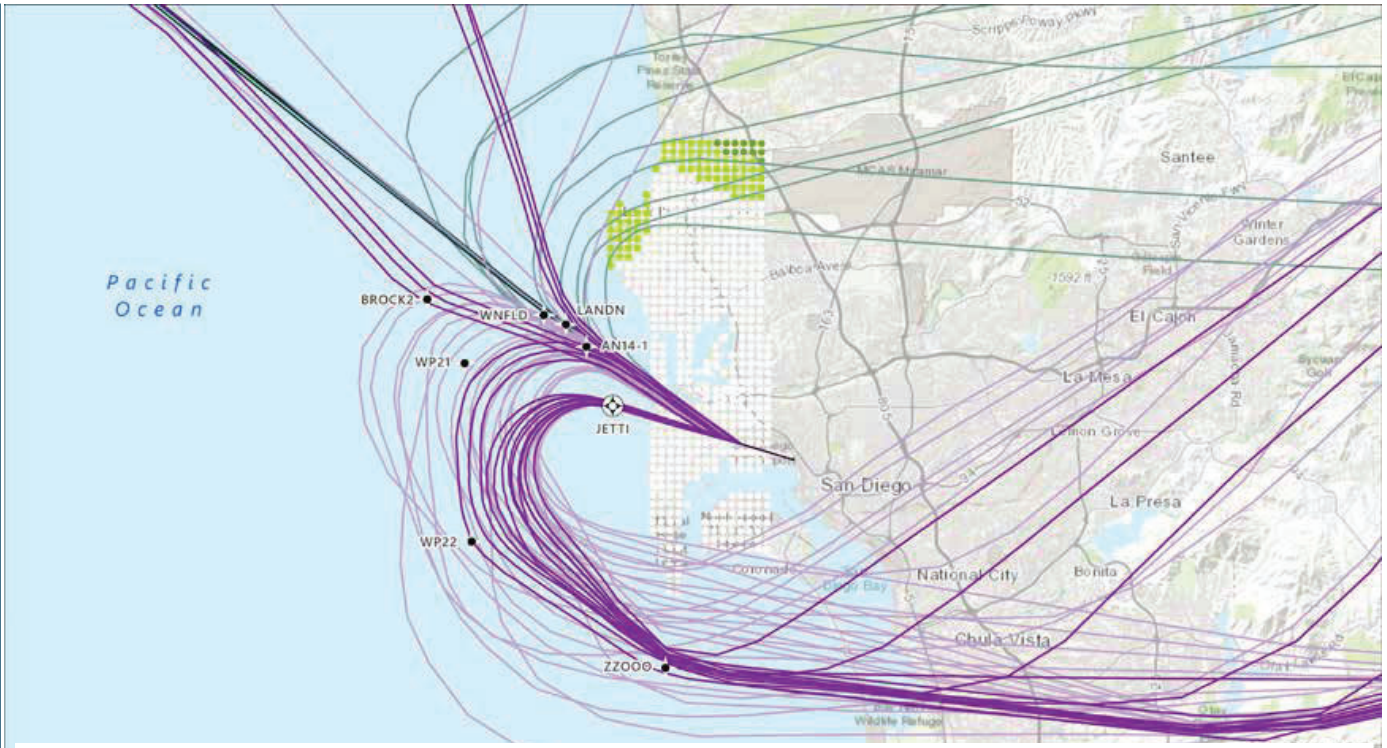
SCENARIO 1 NOISE MODEL TRACKS

RNAV Nighttime Departure Tracks

Conventional Nighttime Departure Tracks

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 1

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB



NOTES:
1/ For illustrative purposes, AEDT noise model tracks for daytime Runway 27 jet departure and arrivals from the northwest to Runway 27 were excluded to more clearly depict only the changes made to Runway 27 nighttime jet departures.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 1 "Fly By" Version 2 and Recommendation 15 Alt 2 Version 2 – AEDT Scenario 1/Baseline RNAV-Only Noise Model Tracks and CNEL Changes

LEGEND

SAN Runway 9-27

BASELINE NOISE MODEL TRACKS

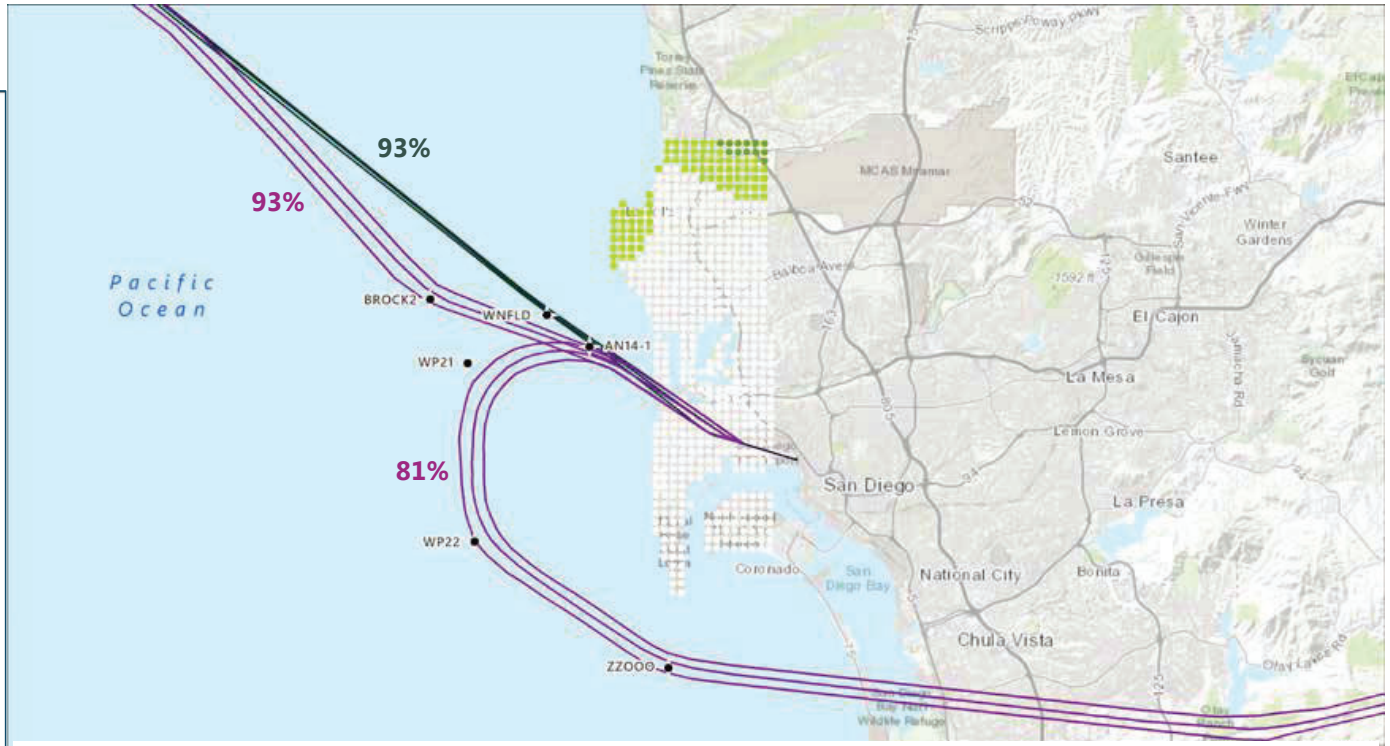
RNAV Nighttime Departure Tracks

SCENARIO 1 NOISE MODEL TRACKS

RNAV Nighttime Departure Tracks

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 1

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

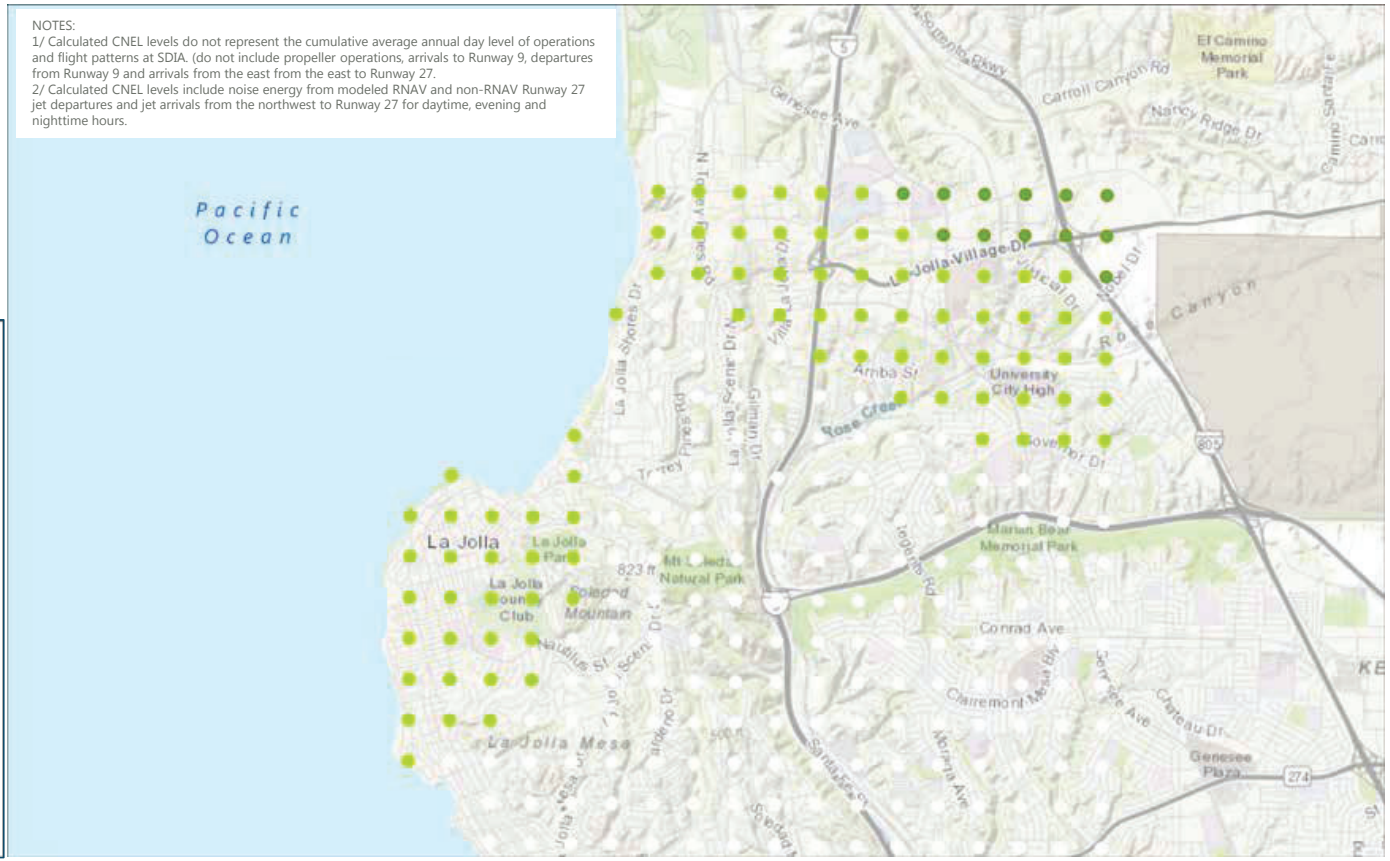


NOTES:
1/ For illustrative purposes, the modeled RNAV tracks are provided to more clearly depict RNAV procedure changes modeled.
2/ RNAV use percentage based on total nighttime Runway 27 jet departures on initial right-turn heading by direction.
3/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
4/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 1 "Fly By" Version 2 and Recommendation 15 Alt 2 Version 2 – Changes in CNEL - North

NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.



LEGEND

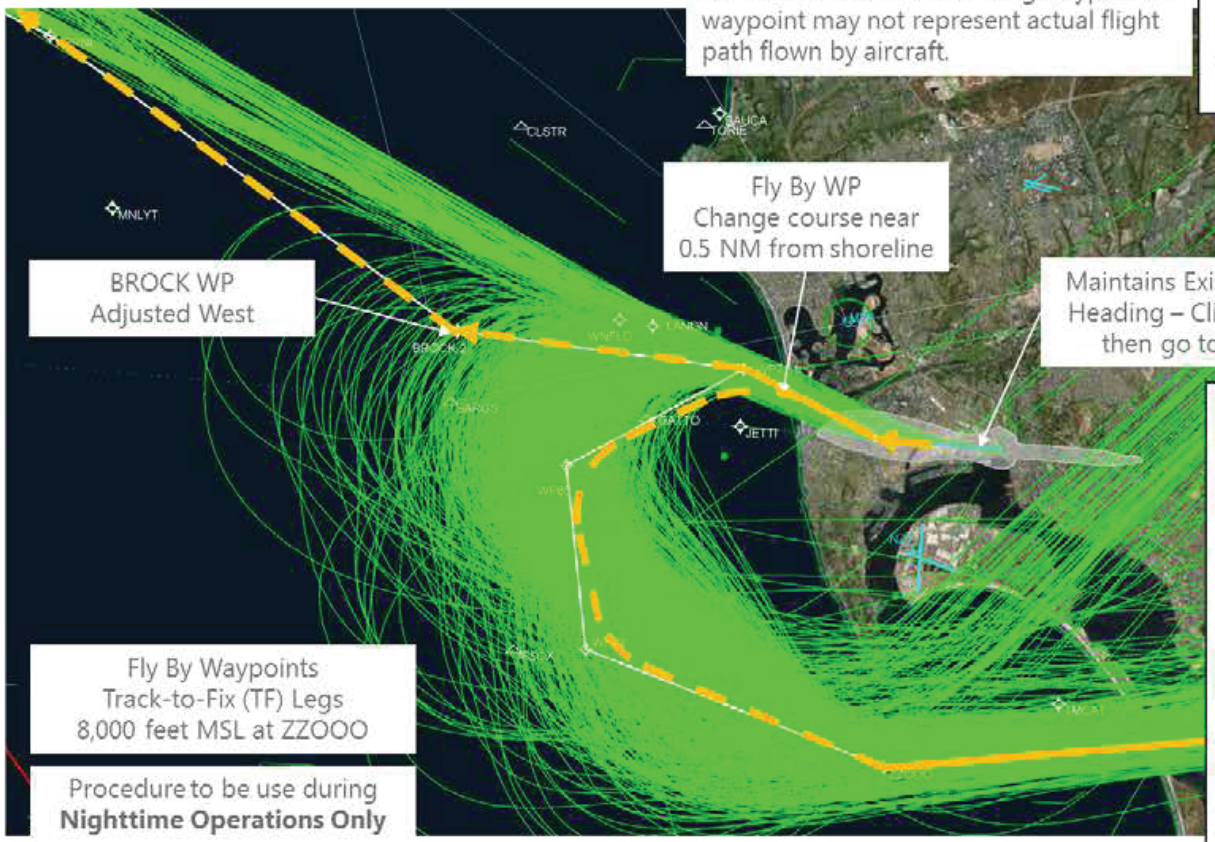
CNEL CHANGE BETWEEN BASELINE TO SCENARIO 1

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 4 and Recommendation 15 Alt 4 – Final Design

Fly By Waypoint



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

Recommended Status: Proceed Forward to Final
Refined concept where aircraft may turn west as soon as possible while maintaining the existing PADRZ SID initial departure path from Runway 27

Fly By WP
Change course near
0.5 NM from shoreline

BROCK WP
Adjusted West

Maintains Existing PADRZ TWO Heading – Climb to 520 ft MSL then go to first waypoint

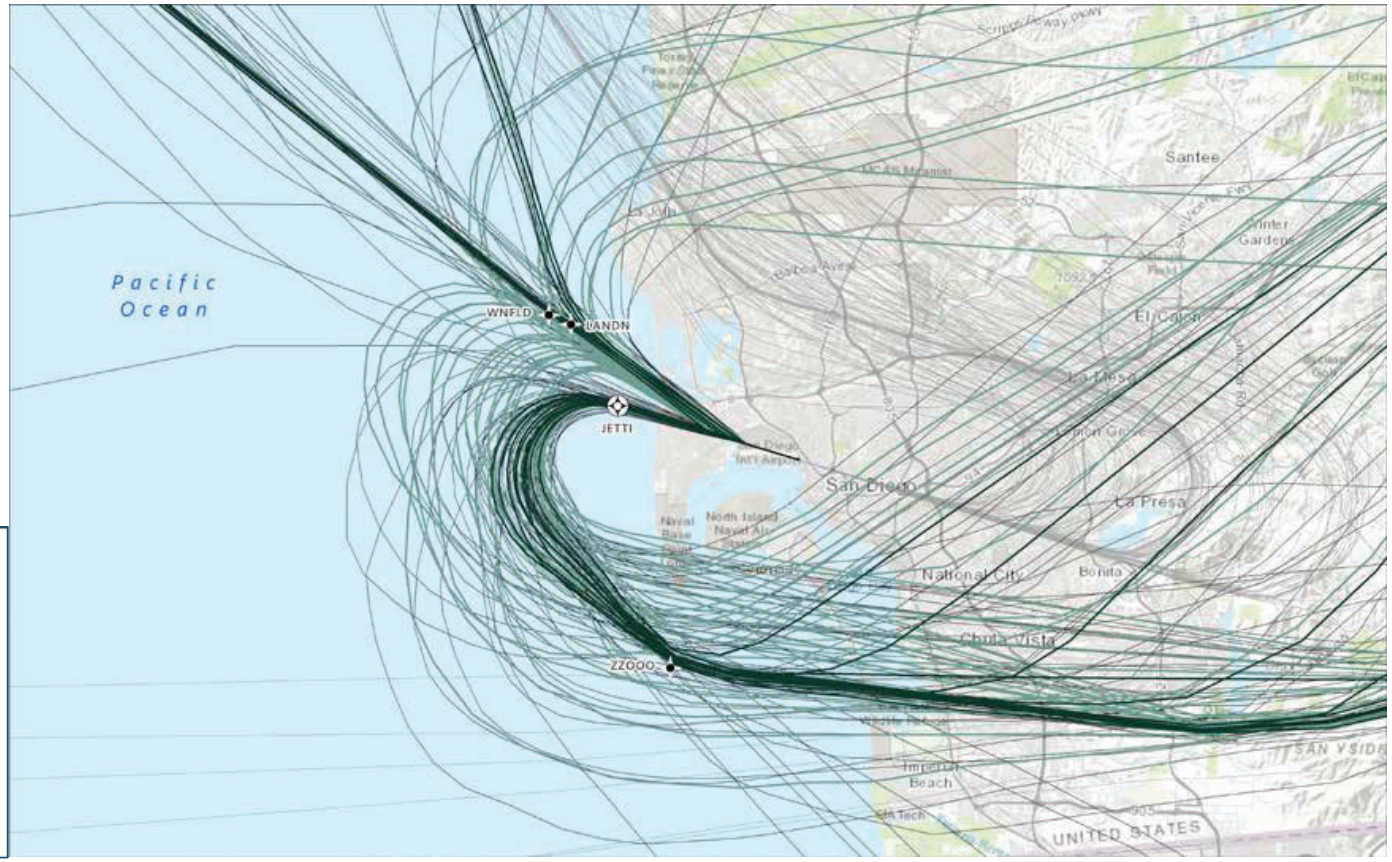
- South/East bound aircraft would turn left towards the south prior at ~ .5 NM west of the shoreline
- North/Northwest bound aircraft would turn left towards the west prior at ~ .5 NM west of the shoreline
- Expected to increase frequency of aircraft at or above 8,000 feet MSL near ZZOOO waypoint, but not as much as Recommendation 15 Alternative 2 due to shorter distance
- Maintains all existing routes after ZZOOO and KERNL waypoints
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Fly By Waypoints
Track-to-Fix (TF) Legs
8,000 feet MSL at ZZOOO

Procedure to be use during
Nighttime Operations Only

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 4 and Recommendation 15 Alt 4 – AEDT Baseline Noise Model Tracks



LEGEND

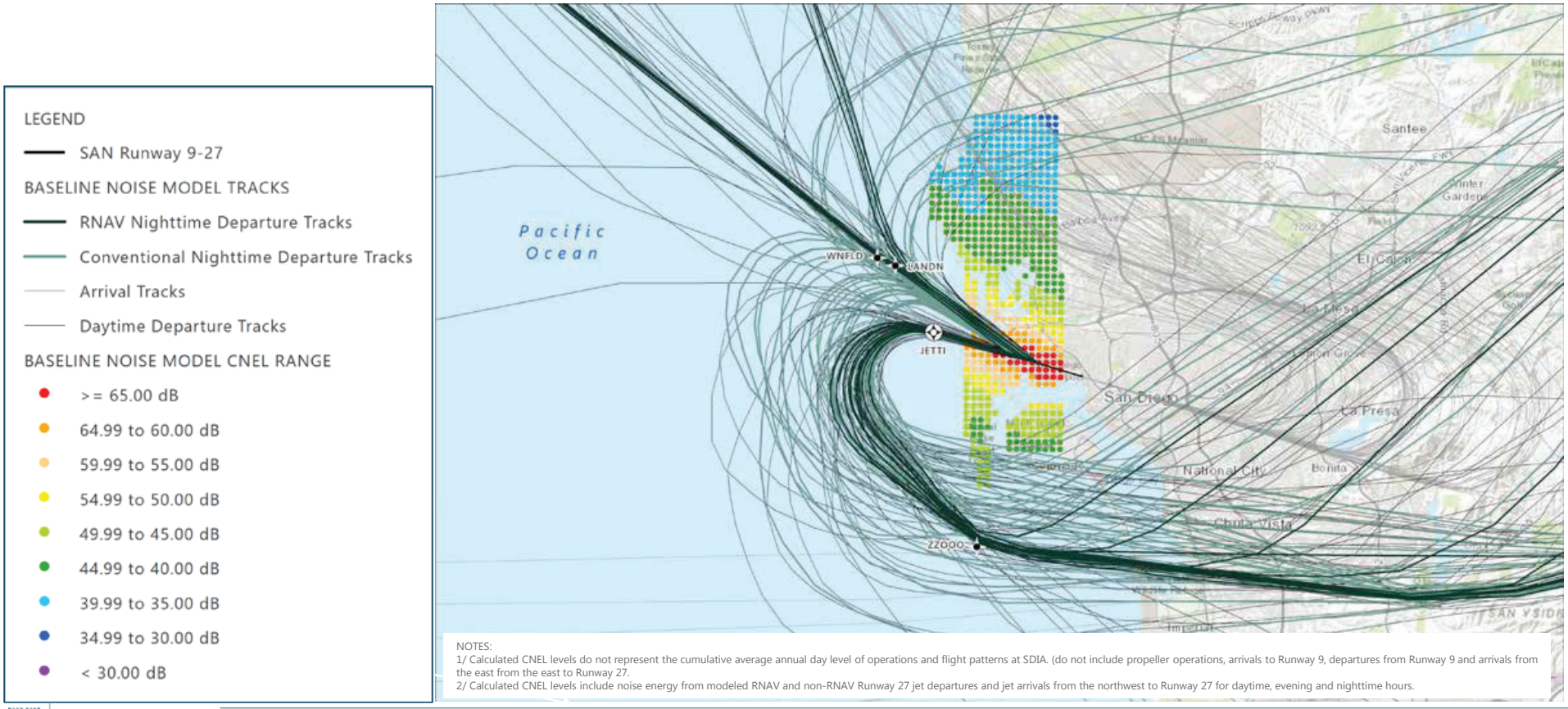
- SAN Runway 9-27

BASELINE NOISE MODEL TRACKS

- RNAV Nighttime Departure Tracks
- Conventional Nighttime Departure Tracks
- Arrival Tracks
- Daytime Departure Tracks

DRAFT Deliberative Document – For Discussion Purposes Only

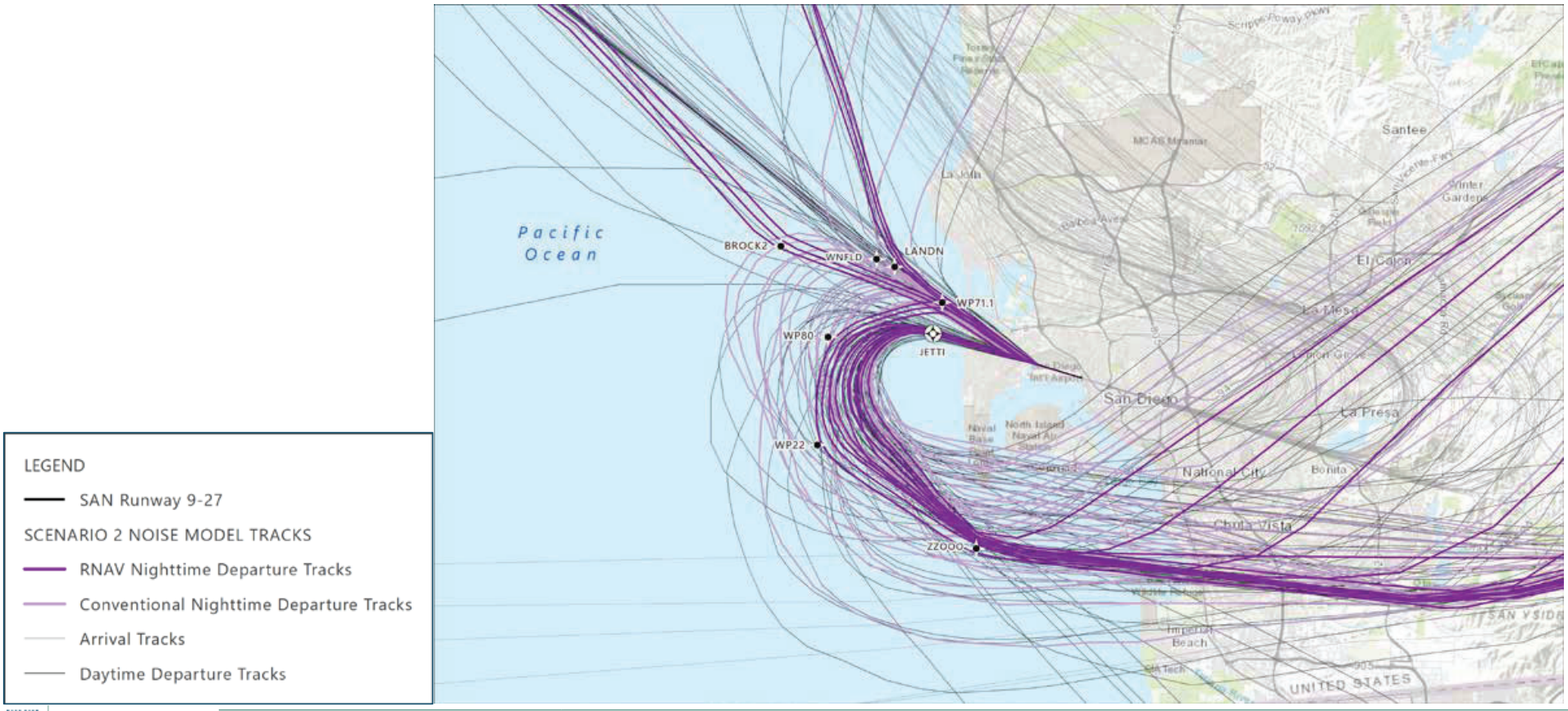
Composite of Recommendation 14 Alt 4 and Recommendation 15 Alt 4 – AEDT Baseline Noise Model Tracks and CNEL Ranges



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 4 and Recommendation 15 Alt 4 – AEDT Scenario 2 Noise Model Tracks



DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 4 and Recommendation 15 Alt 4 – AEDT Scenario 2 Noise Model Tracks and CNEL Ranges

LEGEND

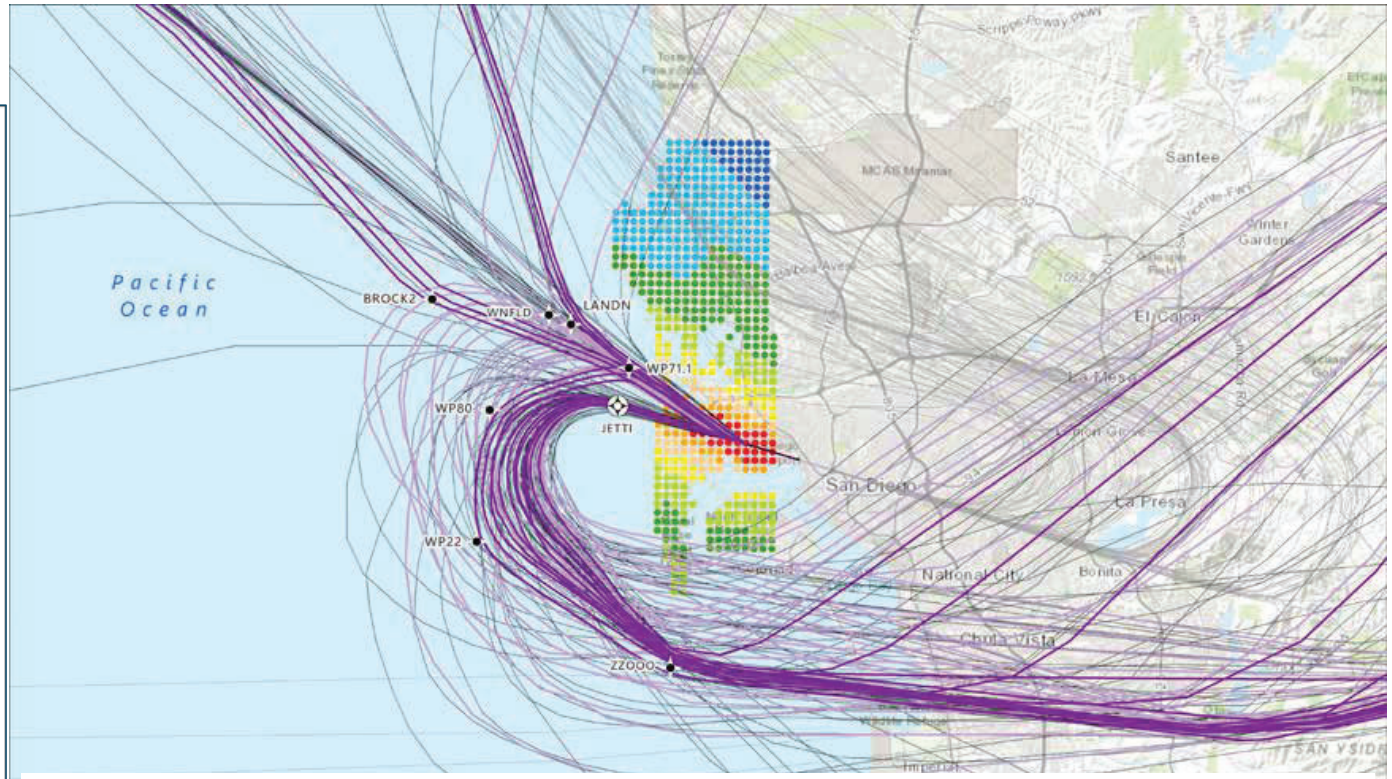
- SAN Runway 9-27

SCENARIO 2 NOISE MODEL TRACKS

- RNAV Nighttime Departure Tracks
- Conventional Nighttime Departure Tracks
- Arrival Tracks
- Daytime Departure Tracks

SCENARIO 2 CNEL RANGE

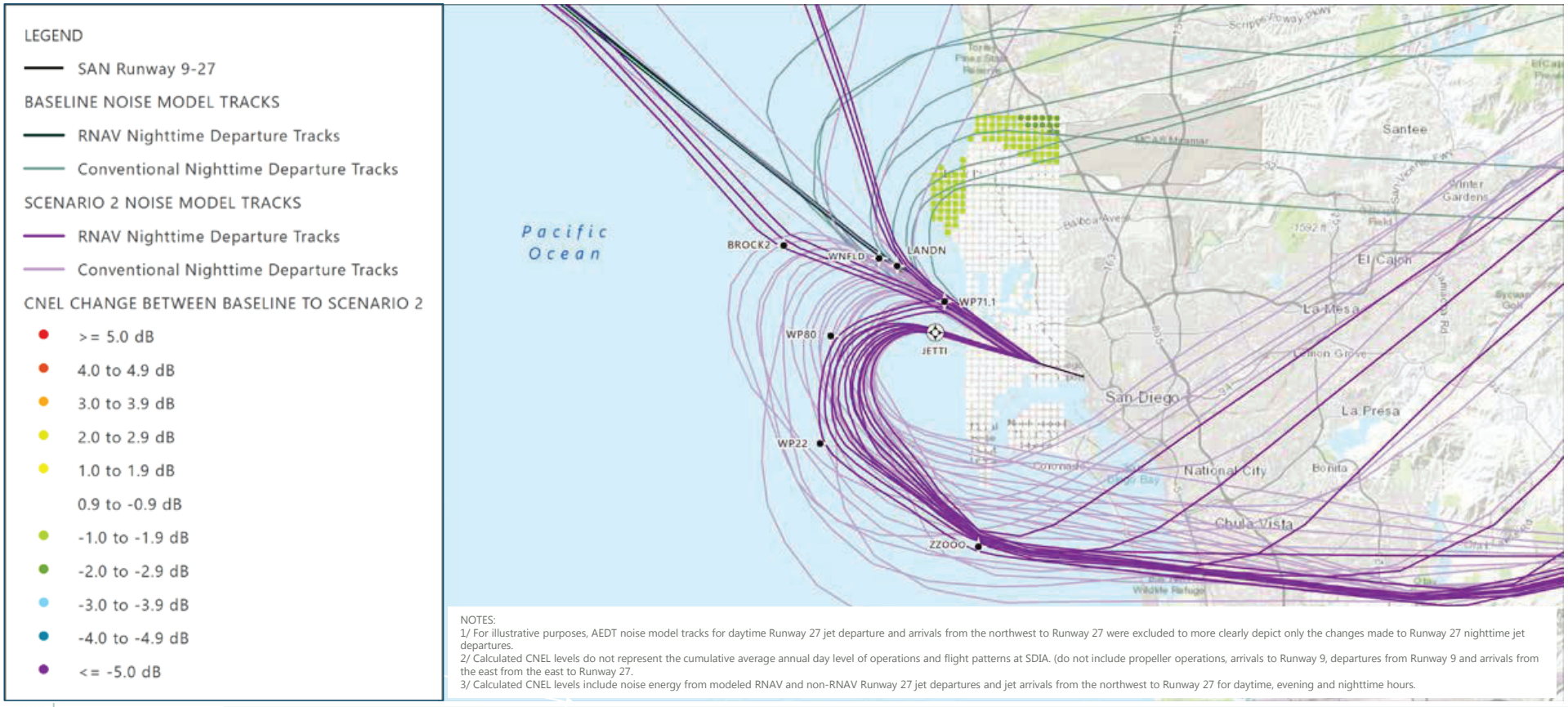
- >= 65.00 dB
- 64.99 to 60.00 dB
- 59.99 to 55.00 dB
- 54.99 to 50.00 dB
- 49.99 to 45.00 dB
- 44.99 to 40.00 dB
- 39.99 to 35.00 dB
- 34.99 to 30.00 dB
- < 30.00 dB



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 4 and Recommendation 15 Alt 4 – AEDT Scenario 2/Baseline Noise Model Tracks and CNEL Changes



NOTES:
1/ For illustrative purposes, AEDT noise model tracks for daytime Runway 27 jet departure and arrivals from the northwest to Runway 27 were excluded to more clearly depict only the changes made to Runway 27 nighttime jet departures.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 4 and Recommendation 15 Alt 4 – AEDT Scenario 2/Baseline RNAV-Only Noise Model Track and CNEL Changes

LEGEND

SAN Runway 9-27

BASELINE NOISE MODEL TRACKS

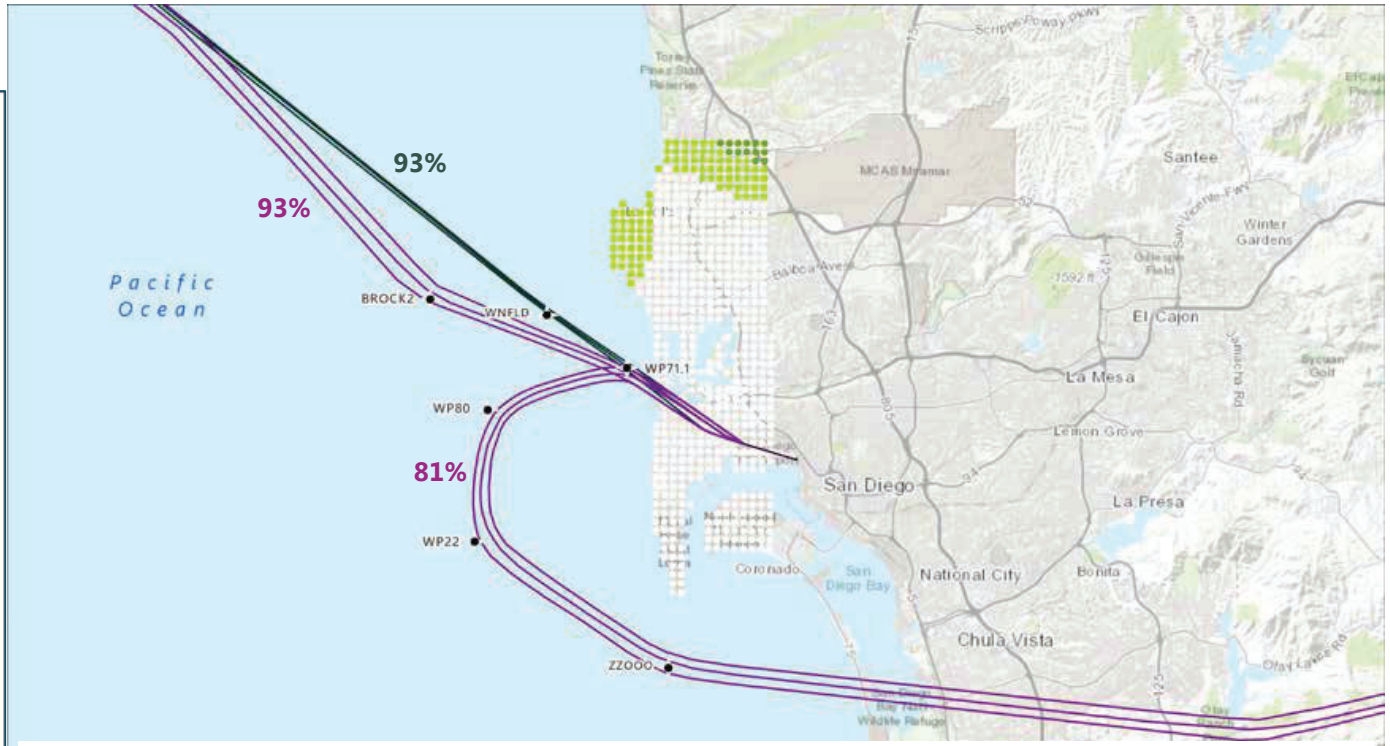
RNAV Nighttime Departure Tracks

SCENARIO 2 NOISE MODEL TRACKS

RNAV Nighttime Departure Tracks

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 2

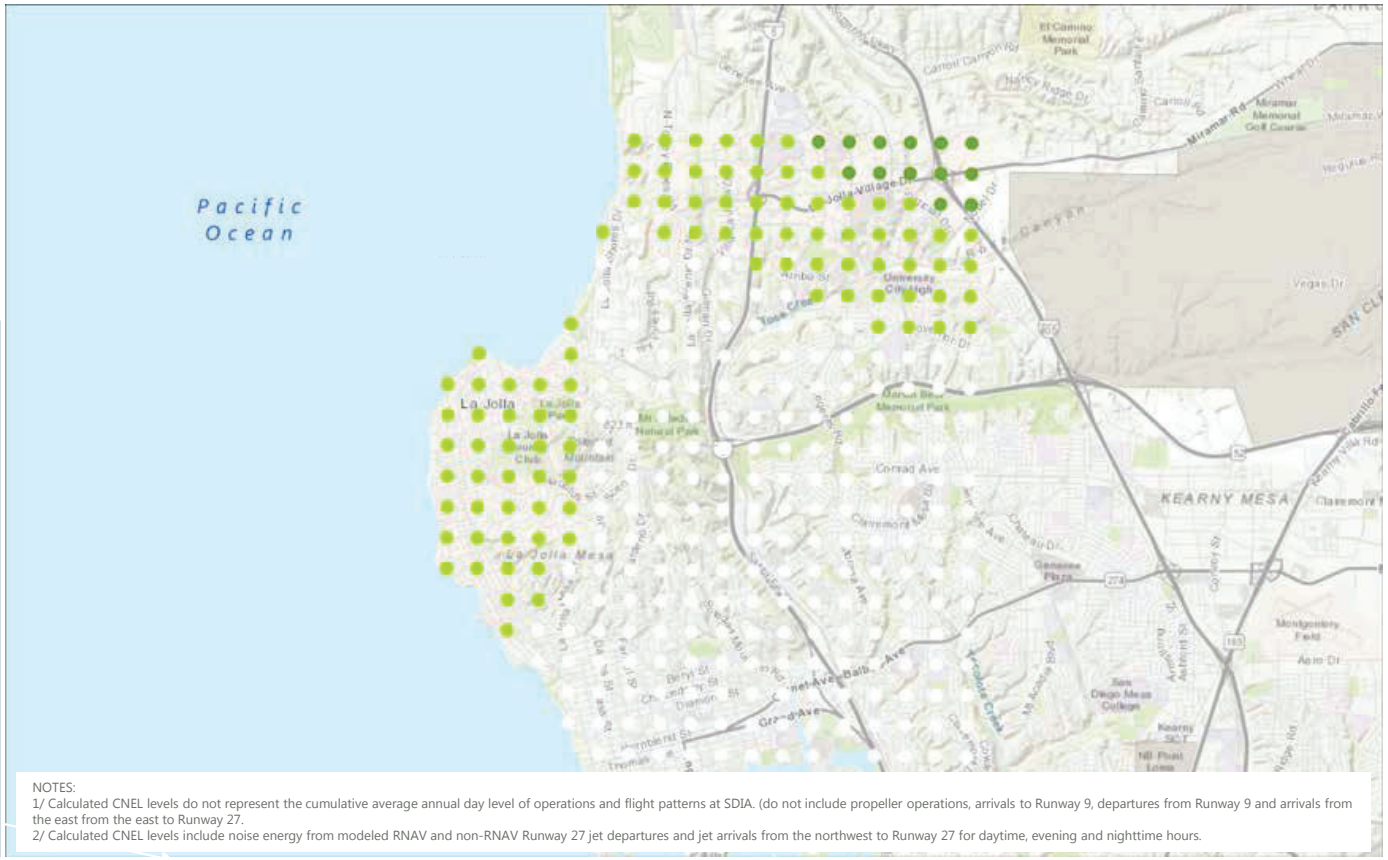
- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB



NOTES:
1/ For illustrative purposes, the modeled RNAV tracks are provided to more clearly depict RNAV procedure changes modeled.
2/ RNAV use percentage based on total nighttime Runway 27 jet departures on initial right-turn heading by direction.
3/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
4/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Composite of Recommendation 14 Alt 4 and Recommendation 15 Alt 4 – Changes in CNEL - North

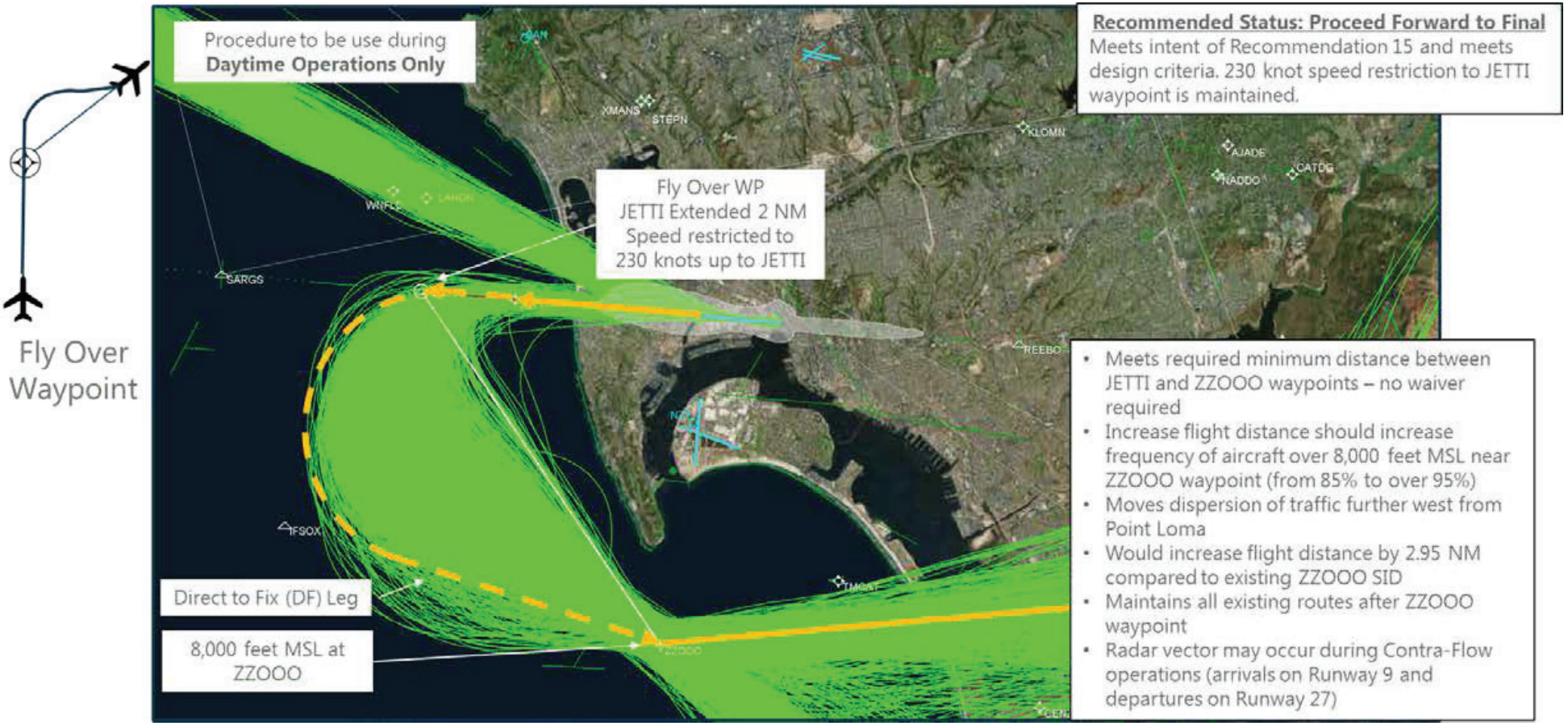


NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

Daytime Departures

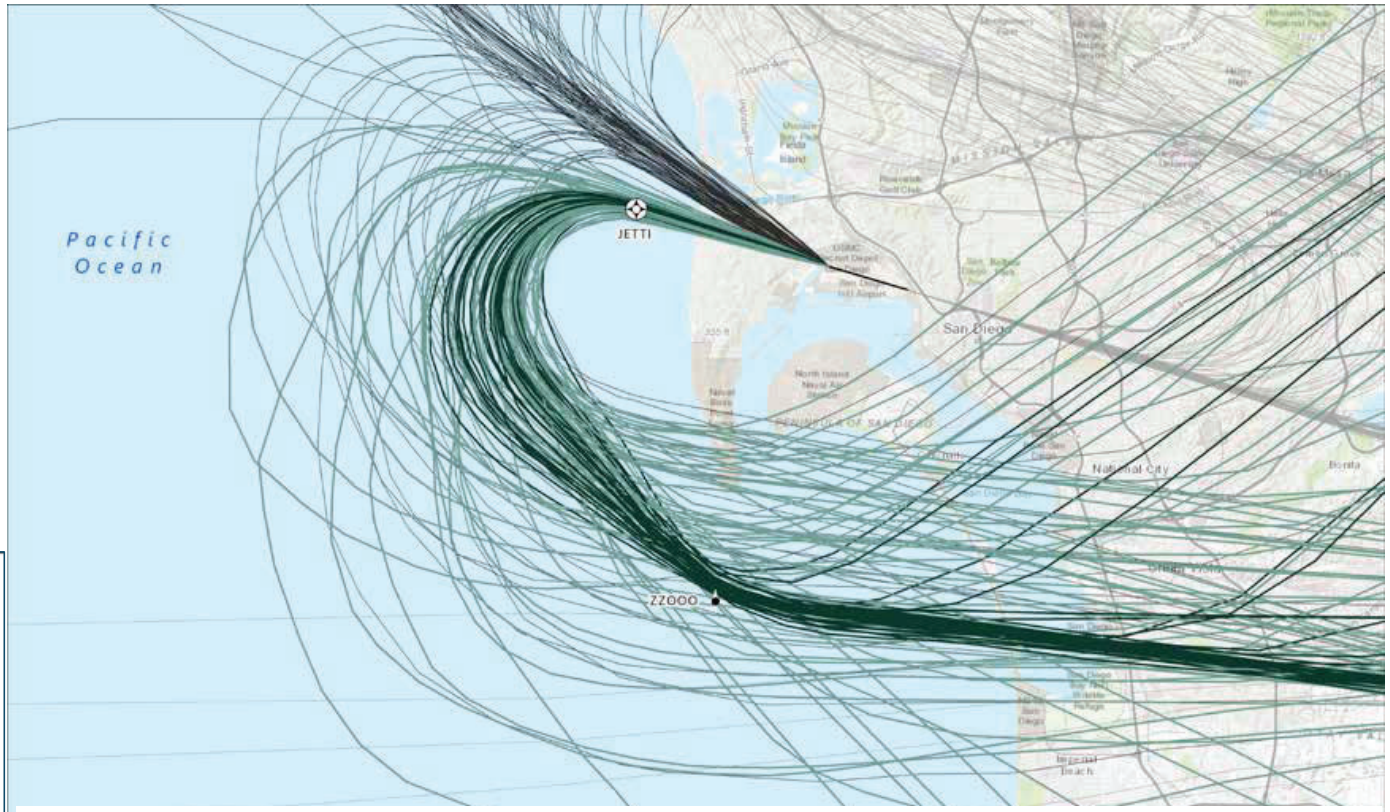
DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 15 Alt 1 Extend JETTI Waypoint 2 NM West - Final Design



DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 15 Alt 1 Extend JETTI Waypoint 2 NM West - AEDT Baseline Noise Model Tracks



LEGEND

SAN Runway 9-27

BASELINE NOISE MODEL TRACKS

RNAV East-Southeast Departure Tracks

Conventional East-Southeast Departure Tracks

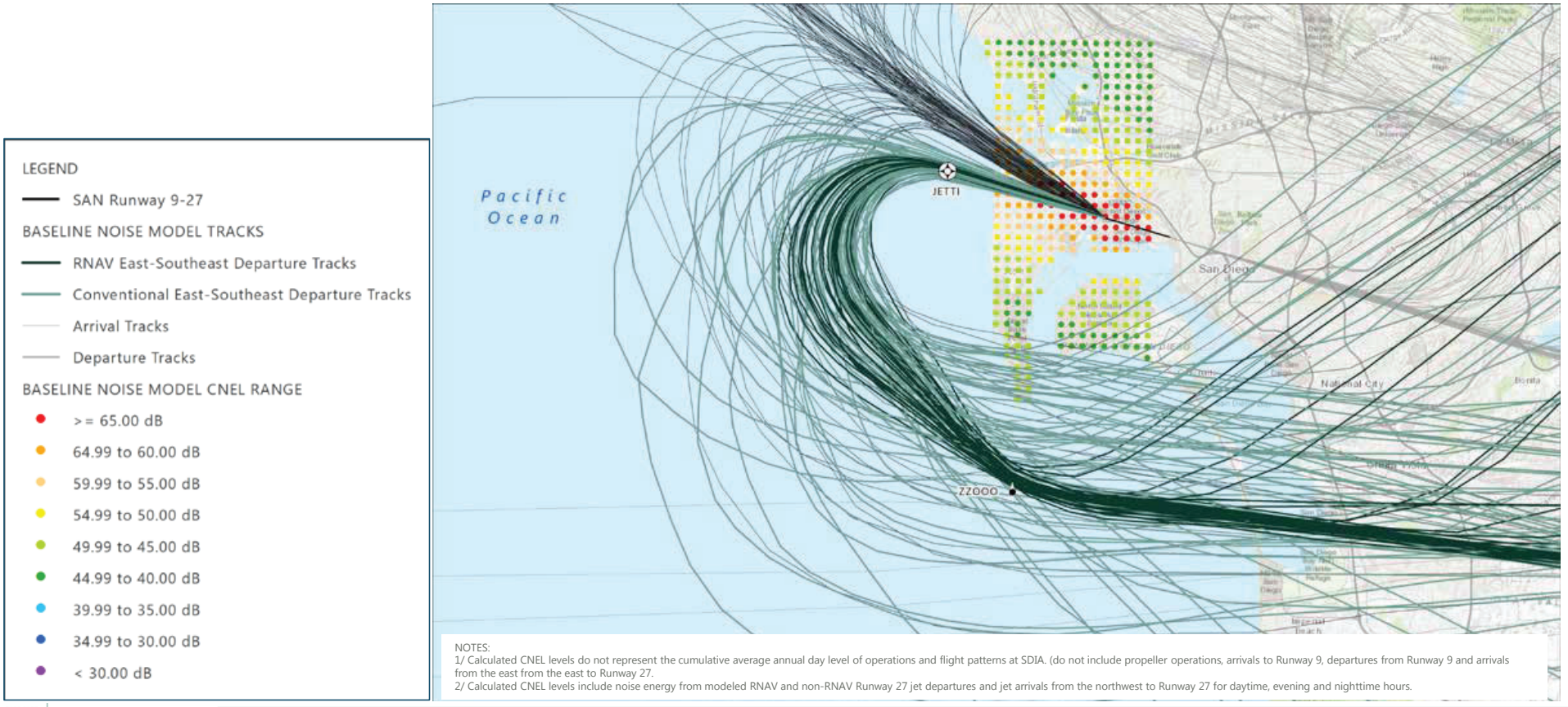
Arrival Tracks

Departure Tracks

NOTES:
1/ FAA Air Traffic Control do assign the ZZOOO RNAV SID between 6:30 a.m. and 6:59 a.m., therefore some CNEL nighttime (10:00 p.m. to 6:59 a.m.) operations were modeled for the Baseline and Scenario 3

DRAFT Deliberative Document – For Discussion Purposes Only

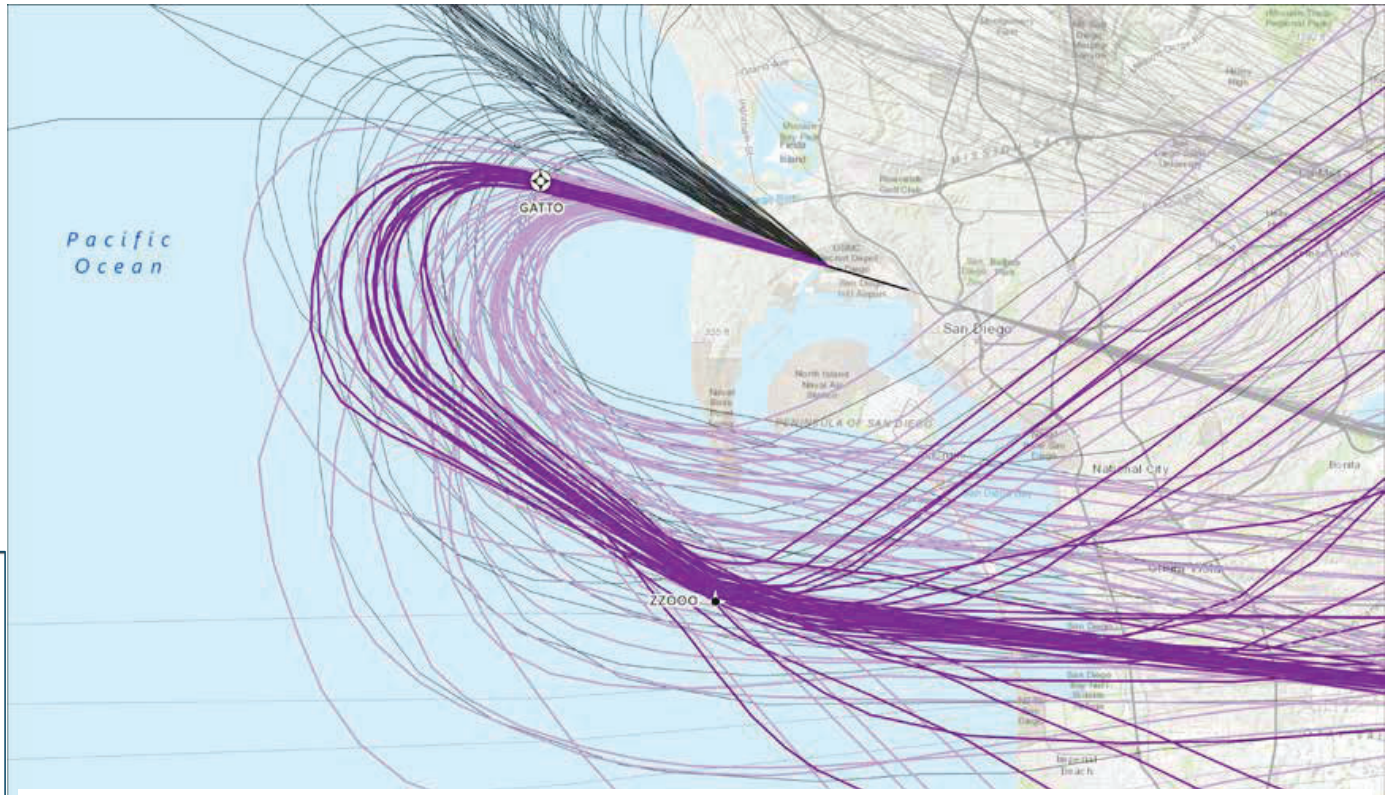
Recommendation 15 Alt 1 Extend JETTI Waypoint 2 NM West - AEDT Baseline Noise Model Tracks and CNEL Ranges



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 15 Alt 1 Extend JETTI Waypoint 2 NM West - AEDT Scenario 3 Noise Model Tracks



LEGEND

- SAN Runway 9-27

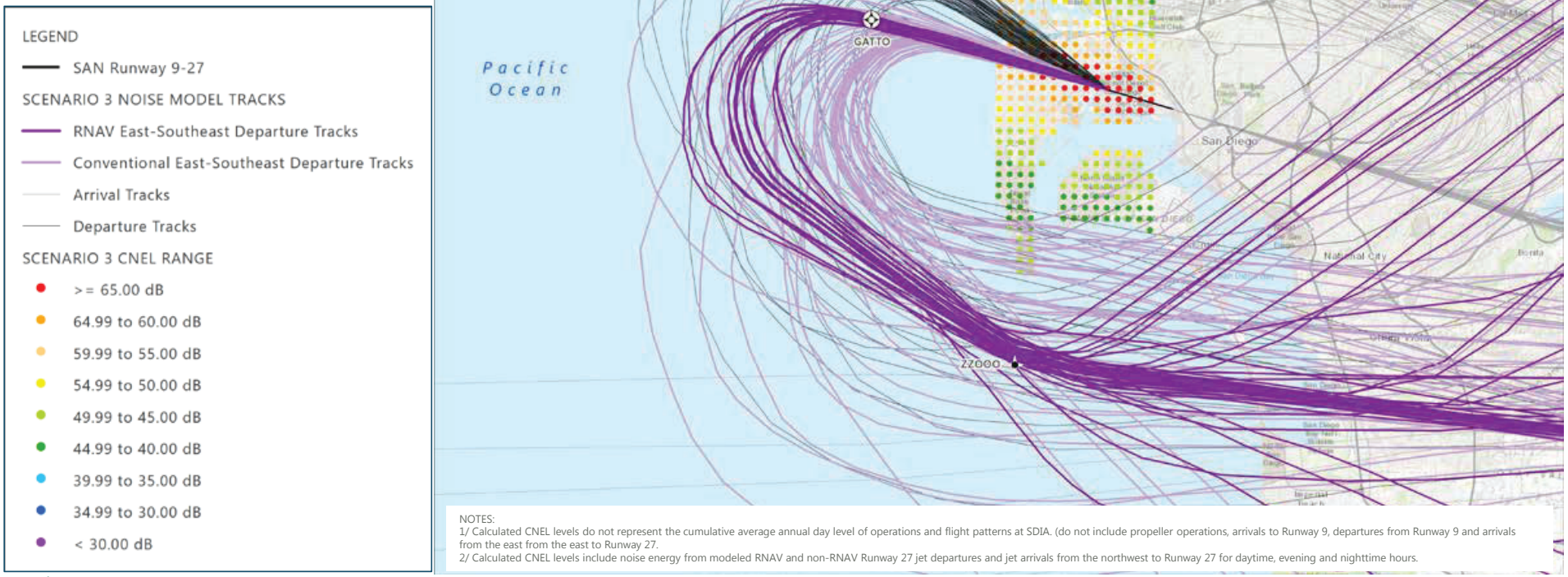
SCENARIO 3 NOISE MODEL TRACKS

- RNAV East-Southeast Departure Tracks
- Conventional East-Southeast Departure Tracks
- Arrival Tracks
- Departure Tracks

NOTES:
1/ FAA Air Traffic Control do assign the ZZOOO RNAV SID between 6:30 a.m. and 6:59 a.m., therefore some CNEL nighttime (10:00 p.m. to 6:59 a.m.) operations were modeled for the Baseline and Scenario 3
2/ Assumed non-RNAV would continue on initial heading until 1.5 nautical miles west of the shore, then turned to the south and east similar to Baseline.

DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 15 Alt 1 Extend JETTI Waypoint 2 NM West - AEDT Scenario 3 Noise Model Tracks and CNEL Ranges



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 15 – Alt 1 Extend JETTI Waypoint 2 NM West AEDT Scenario 3/Baseline Noise Model Tracks and CNEL Changes

LEGEND

SAN Runway 9-27

BASELINE NOISE MODEL TRACKS

RNAV Nighttime Departure Tracks

Conventional Nighttime Departure Tracks

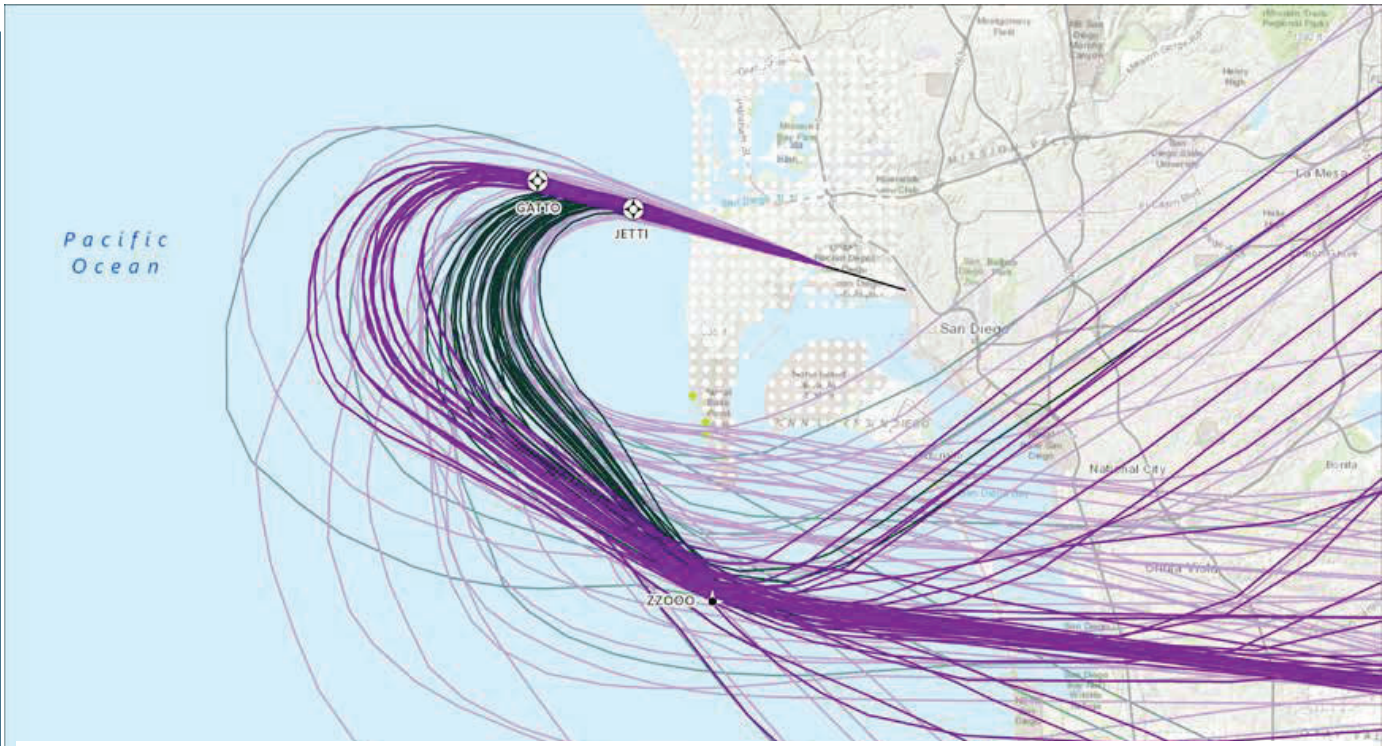
SCENARIO 2 NOISE MODEL TRACKS

RNAV Nighttime Departure Tracks

Conventional Nighttime Departure Tracks

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 2

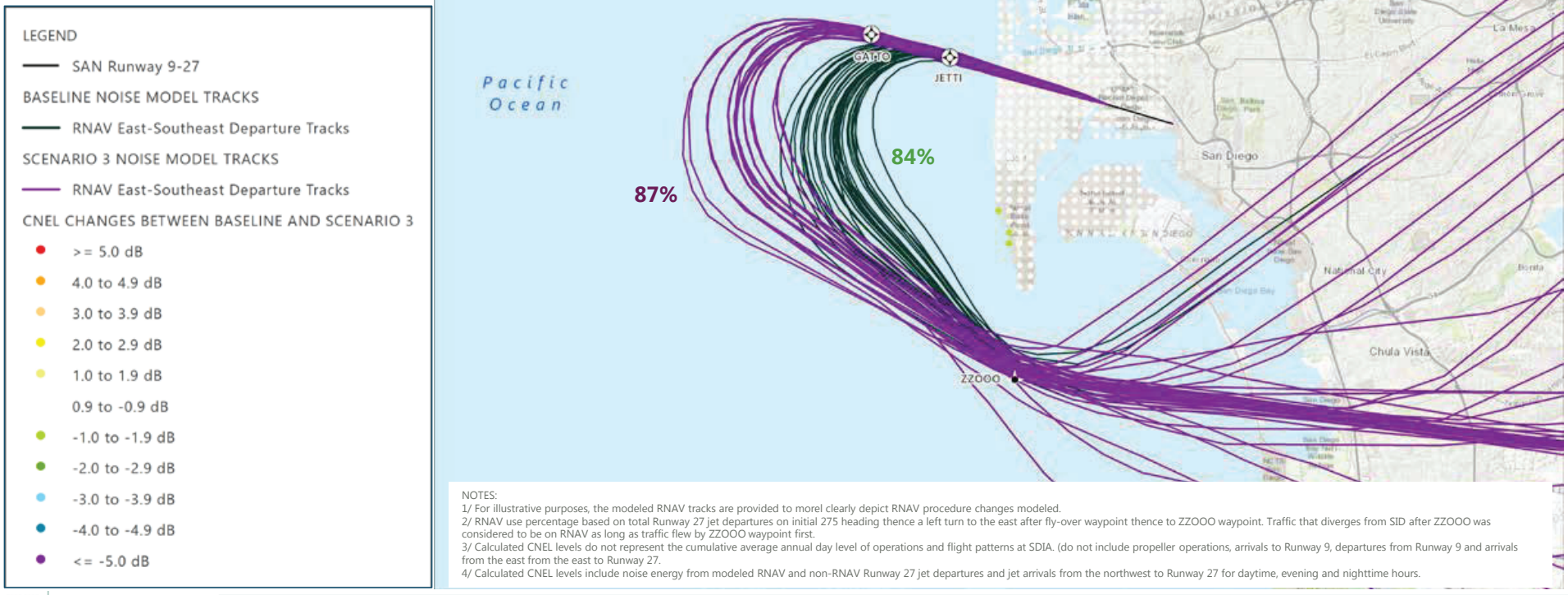
- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB



NOTES:
1/ For illustrative purposes, AEDT noise model tracks for Runway 27 jet departures that turn right from Runway 27 then head to the north/northwest or south then east and arrivals from the northwest to Runway 27 were excluded to more clearly depict only the changes made to Runway 27 jet departures that turn left to the south and then to the east.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

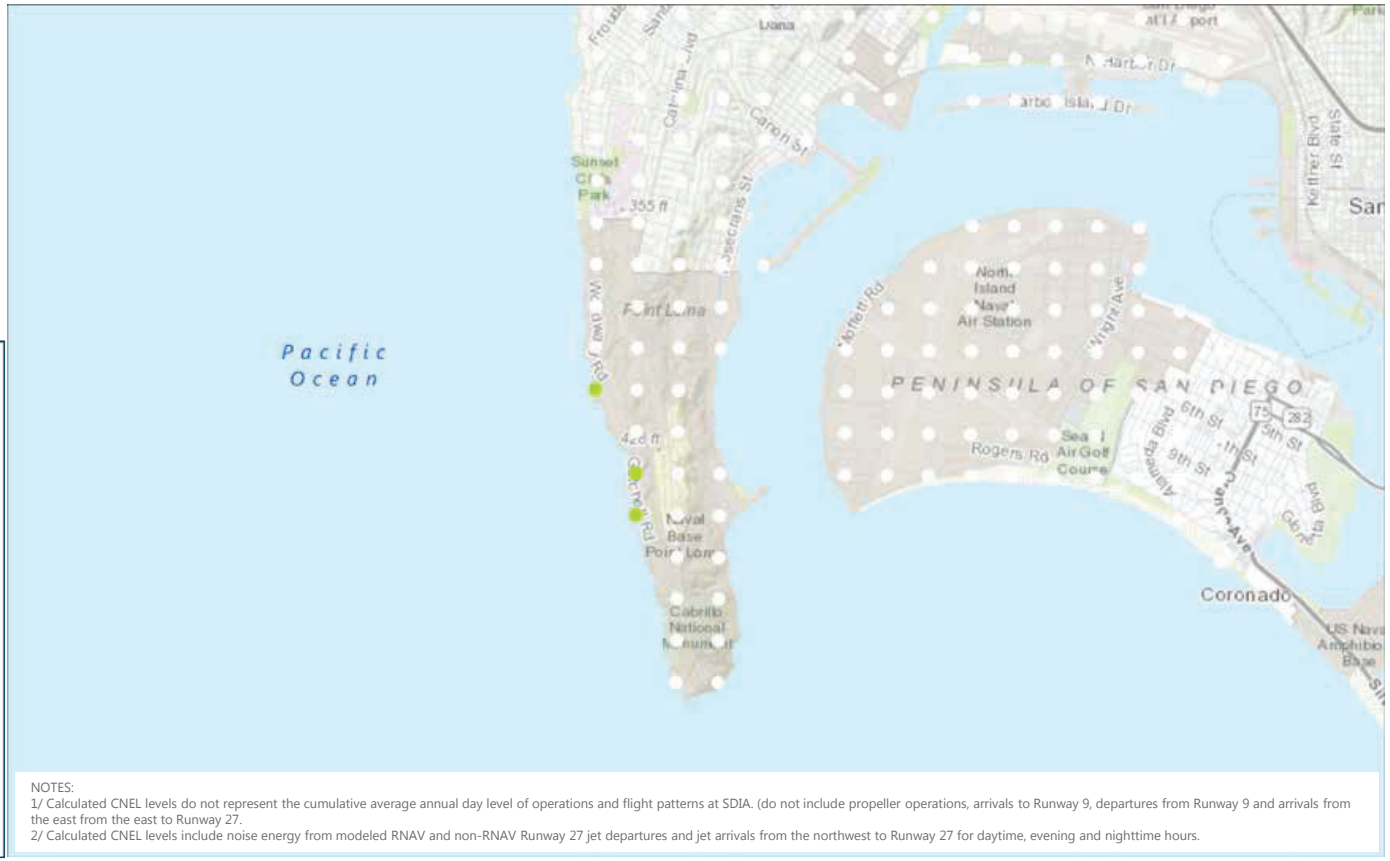
ANAC Noise Recommendation 15 – Alt 1 Extend JETTI Waypoint 2 NM West AEDT Scenario 3/Baseline RNAV-Only Noise Model Track and CNEL Changes



NOTES:
1/ For illustrative purposes, the modeled RNAV tracks are provided to morel clearly depict RNAV procedure changes modeled.
2/ RNAV use percentage based on total Runway 27 jet departures on initial 275 heading thence a left turn to the east after fly-over waypoint thence to ZZOOO waypoint. Traffic that diverges from SID after ZZOOO was considered to be on RNAV as long as traffic flew by ZZOOO waypoint first.
3/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
4/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 15 Alt 1 Extend JETTI Waypoint 2 NM West - Changes in CNEL - South

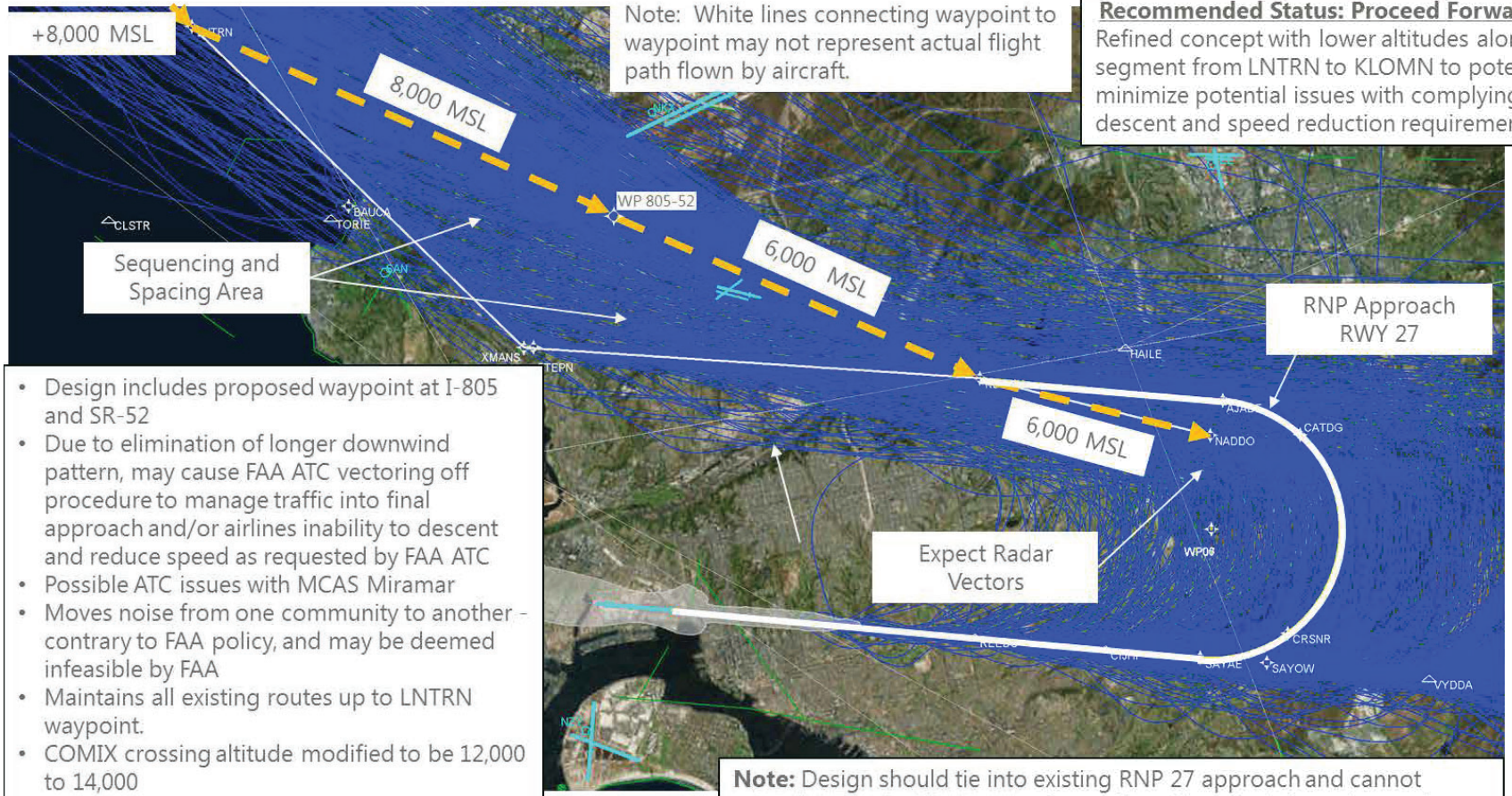


NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

Daytime/Nighttime Arrivals

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Noise Recommendation 16 – Alt 1 Version 3 – Final Design



Note: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

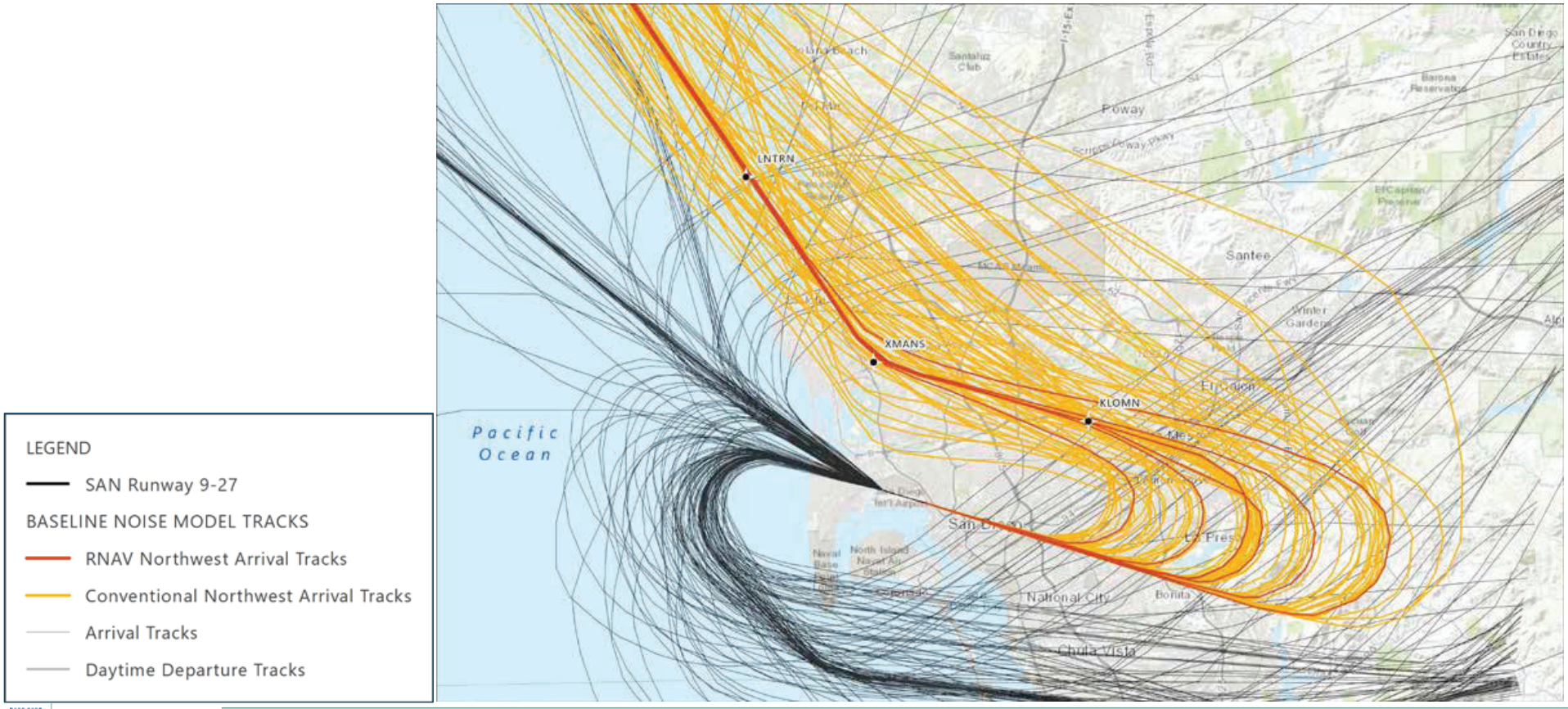
Recommended Status: Proceed Forward to Final
Refined concept with lower altitudes along straight segment from LNTRN to KLOMN to potentially minimize potential issues with complying with descent and speed reduction requirements.

- Design includes proposed waypoint at I-805 and SR-52
- Due to elimination of longer downwind pattern, may cause FAA ATC vectoring off procedure to manage traffic into final approach and/or airlines inability to descent and reduce speed as requested by FAA ATC
- Possible ATC issues with MCAS Miramar
- Moves noise from one community to another - contrary to FAA policy, and may be deemed infeasible by FAA
- Maintains all existing routes up to LNTRN waypoint.
- COMIX crossing altitude modified to be 12,000 to 14,000
- Reduces the flight track 1 NM

Note: Design should tie into existing RNP 27 approach and cannot extend downwind further east in conflict with arrivals from the northeast

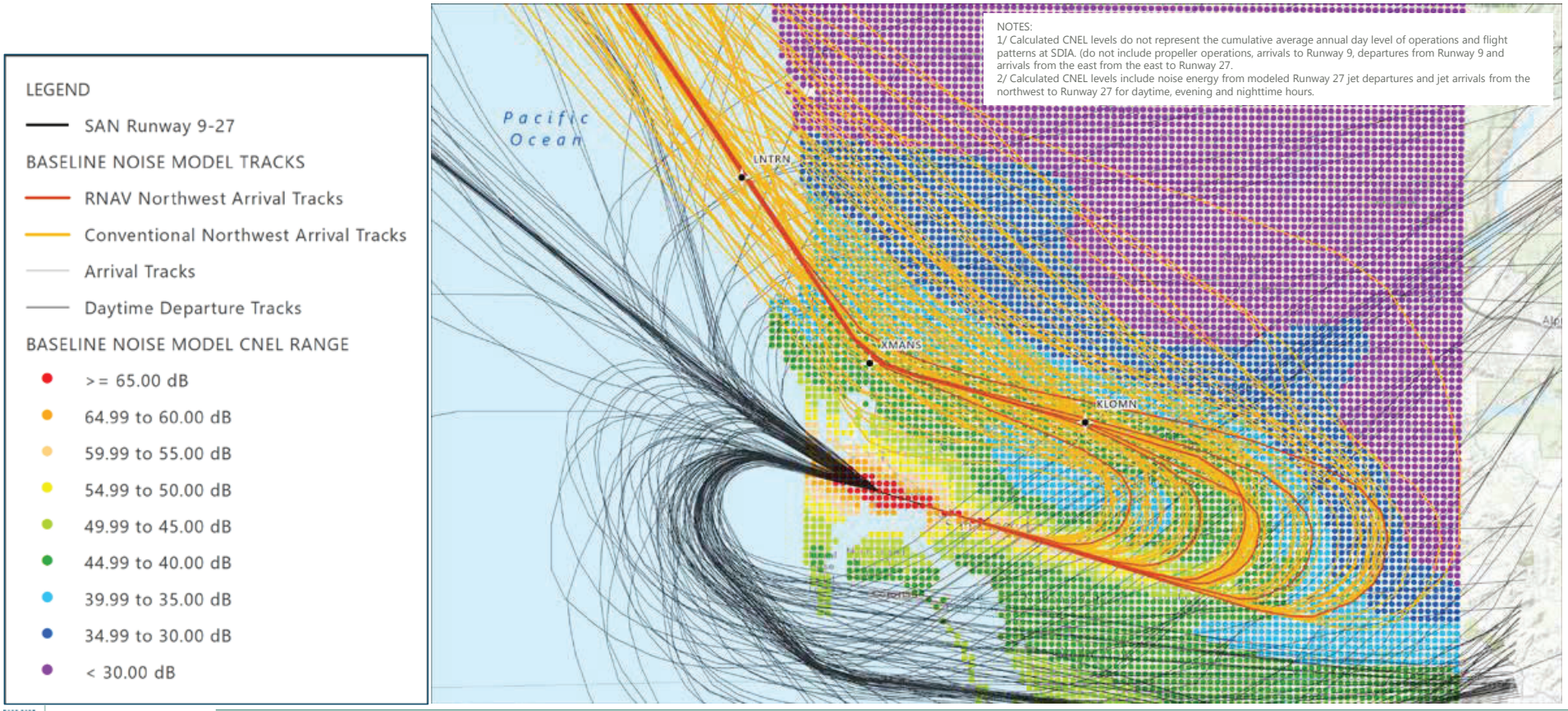
DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 16 Alt 1 Version 3 – AEDT Baseline Noise Model Tracks



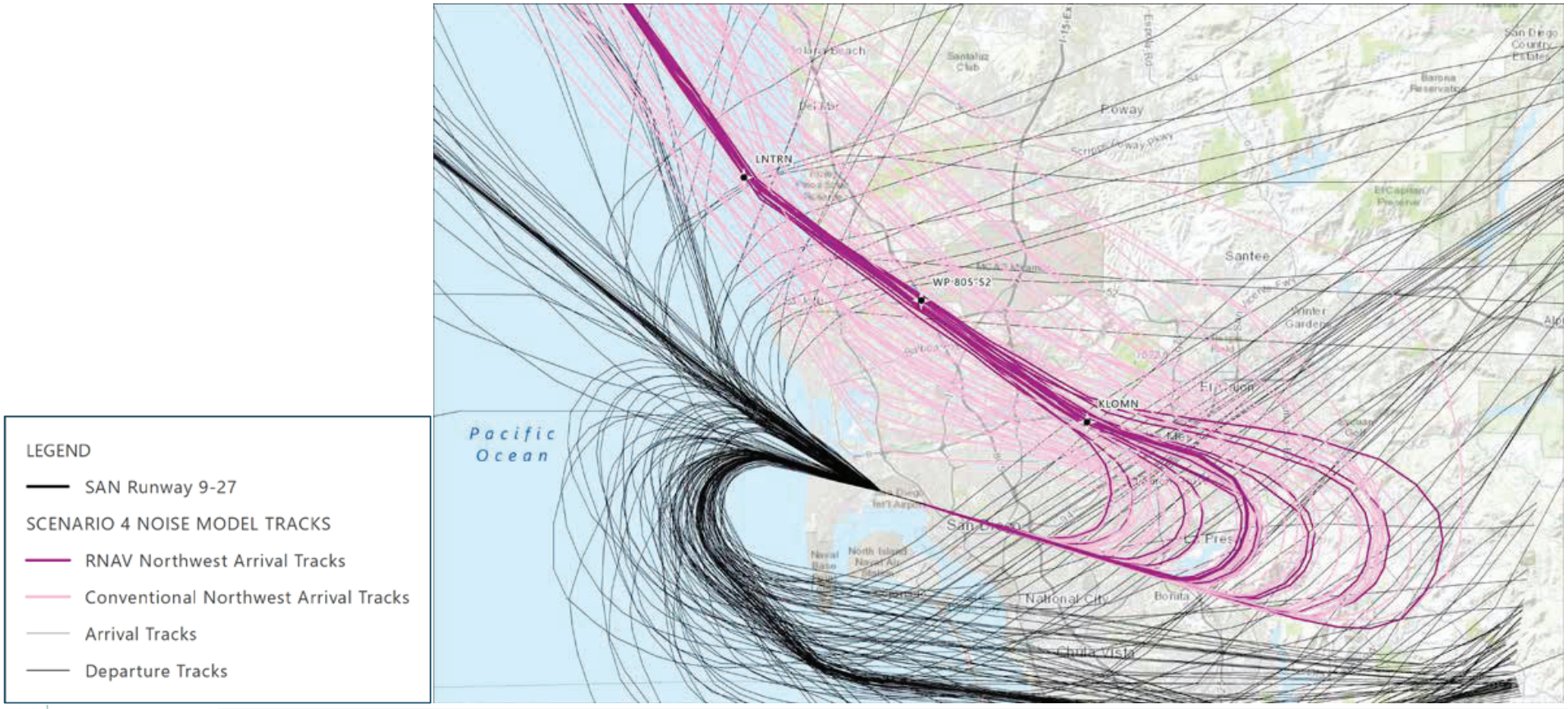
DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 16 Alt 1 Version 3 – AEDT Baseline Noise Model Tracks and CNEL Ranges



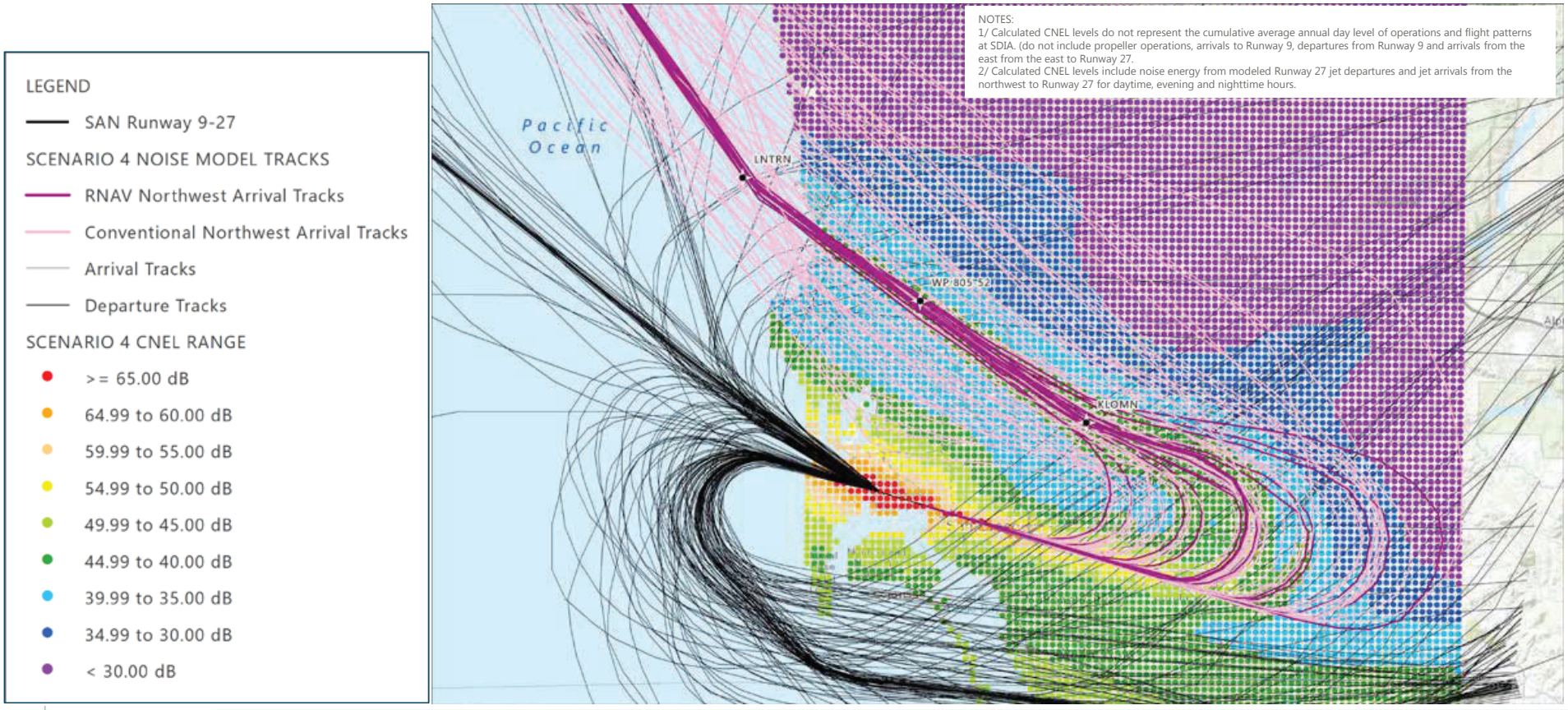
DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 16 Alt 1 Version 3 – AEDT Scenario 4 Noise Model Tracks



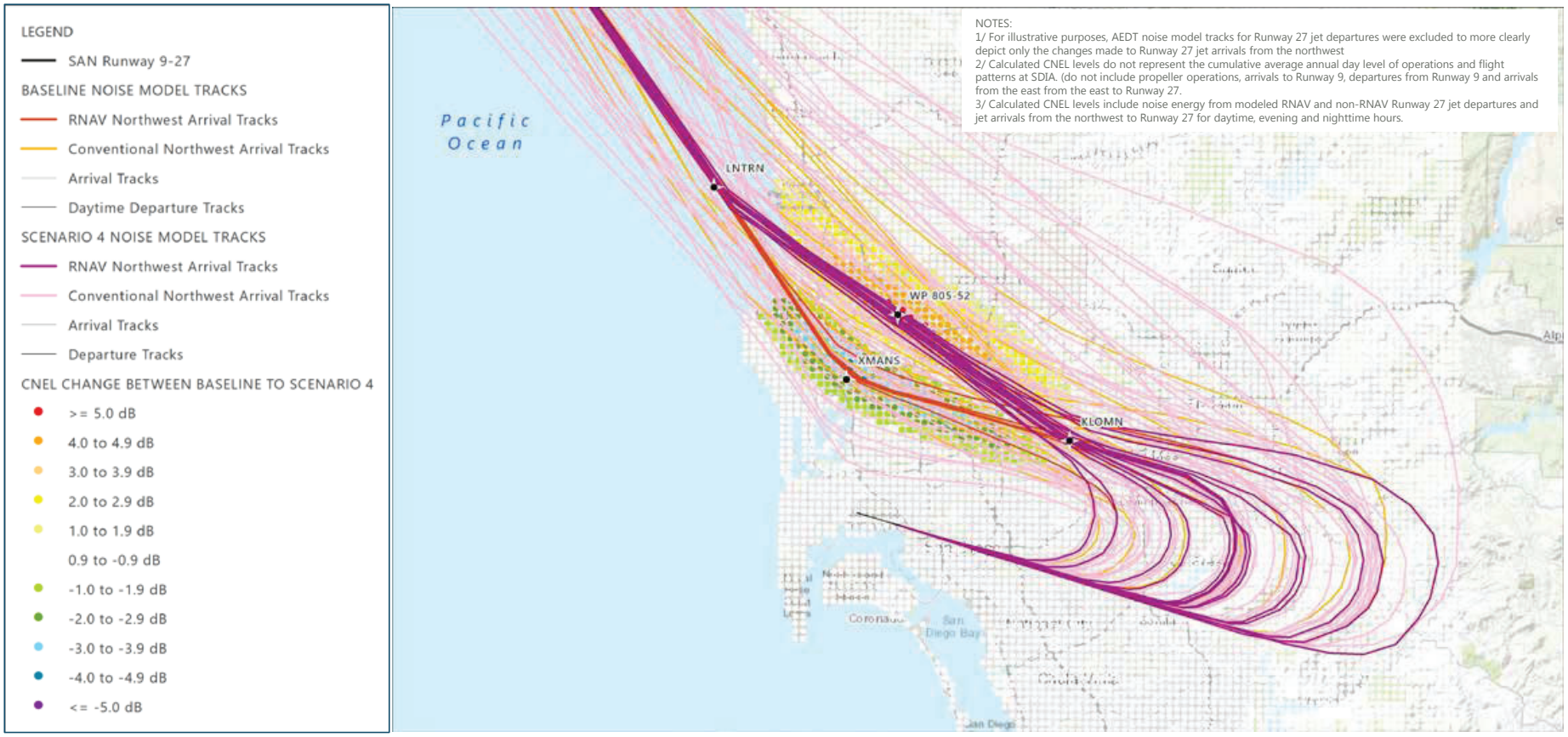
DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 16 Alt 1 Version 3 – AEDT Scenario 4 Noise Model Tracks and CNEL Ranges



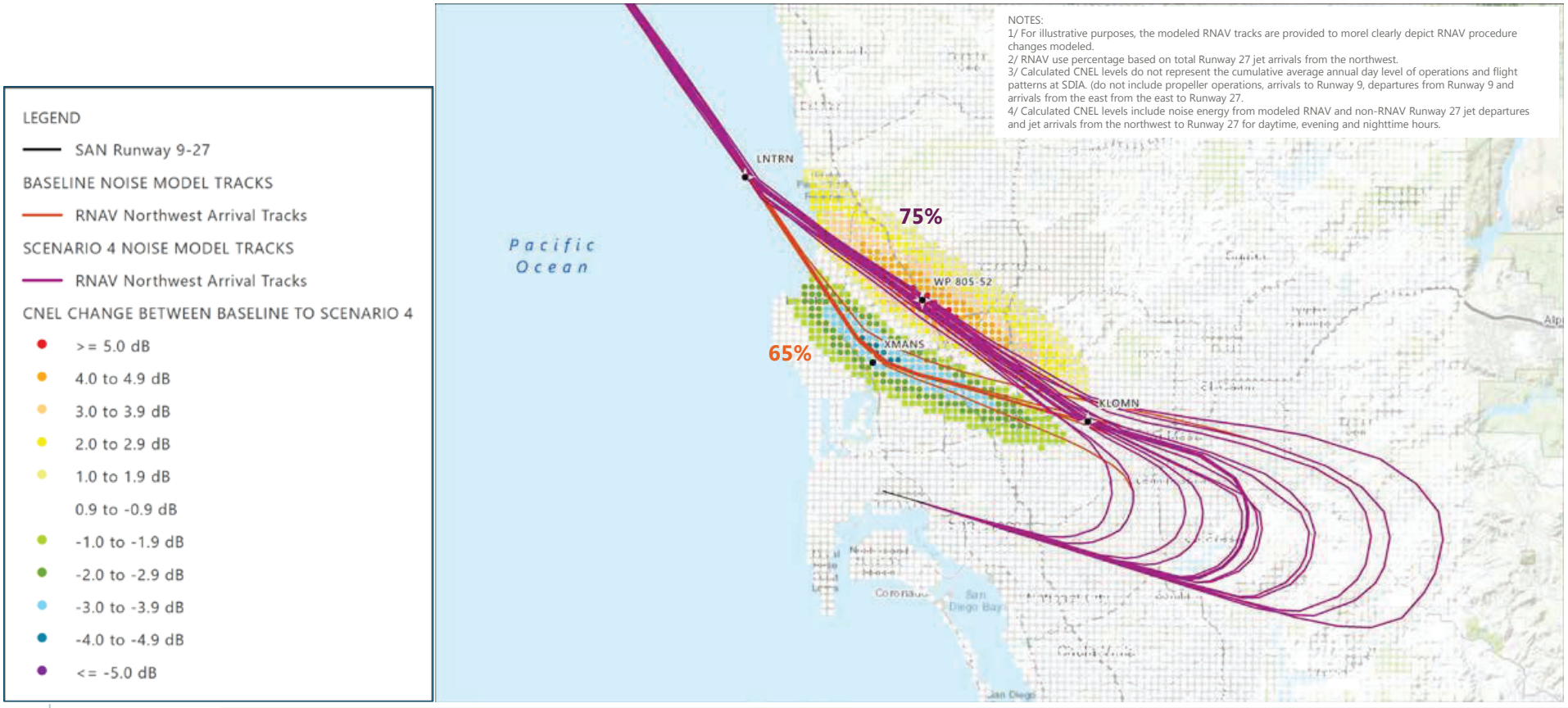
DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 16 Alt 1 Version 3 – AEDT Scenario 4/Baseline Noise Model Tracks and CNEL Changes



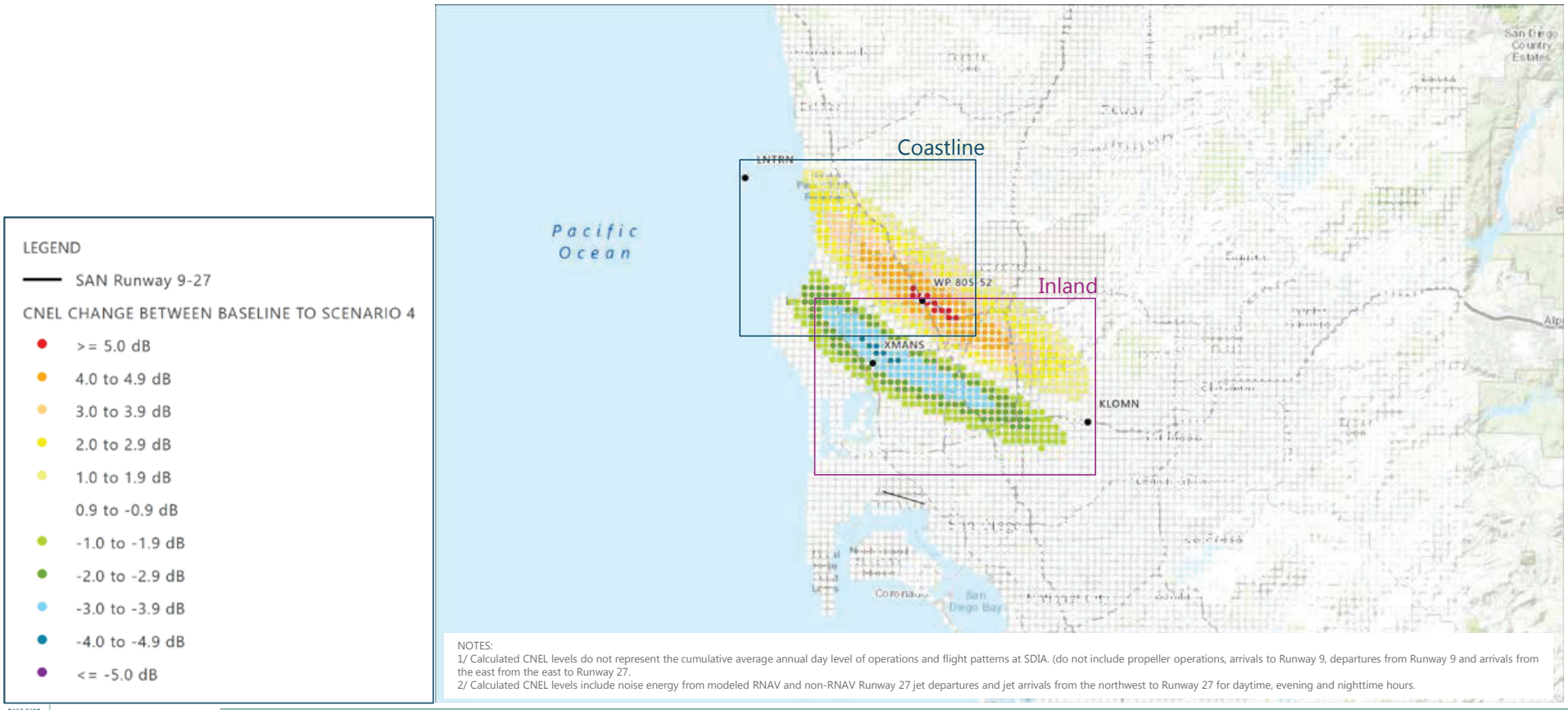
DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 16 Alt 1 Version 3 – AEDT Scenario 4/Baseline RNAV-Only Noise Model Tracks and CNEL Changes



DRAFT Deliberative Document – For Discussion Purposes Only

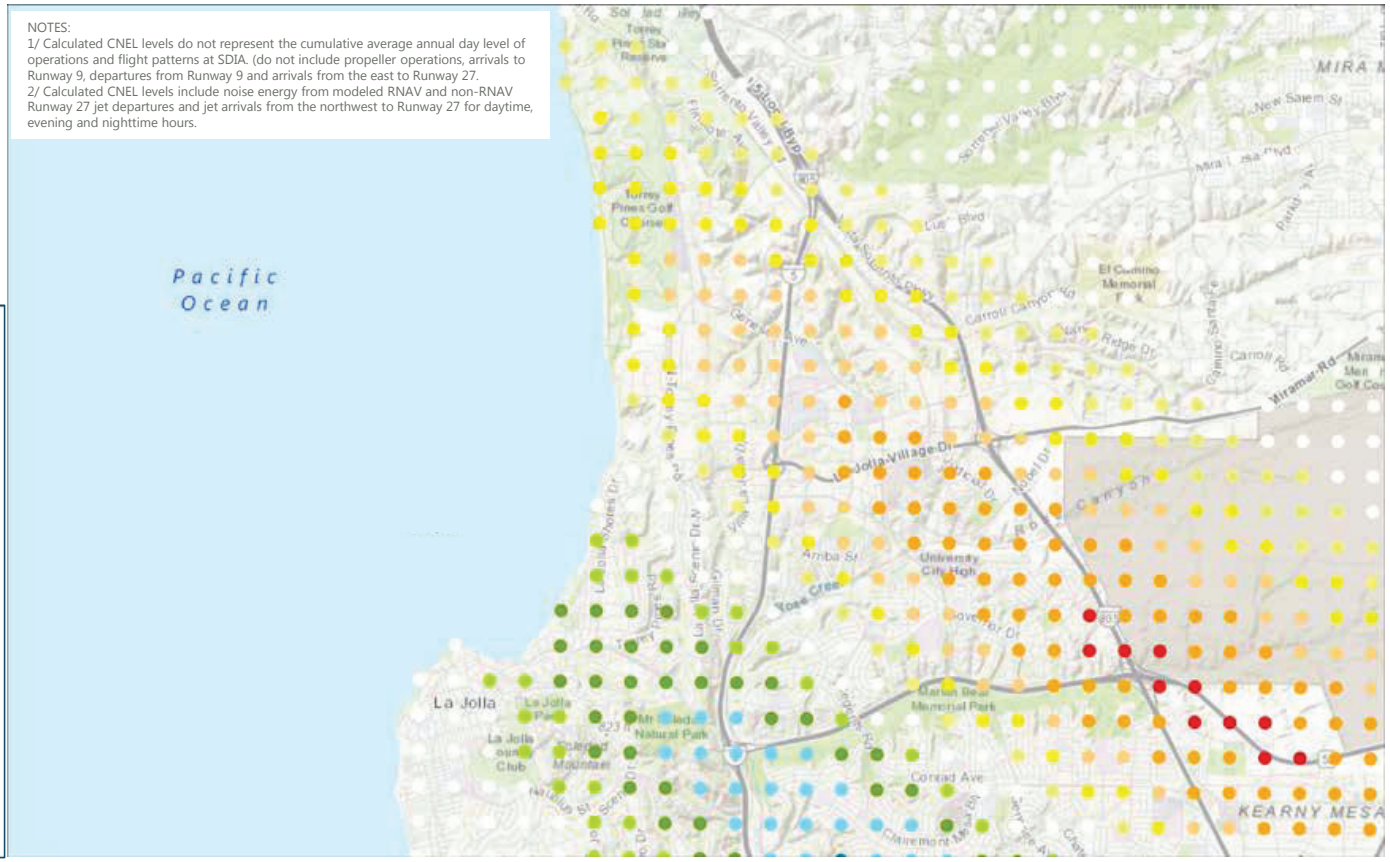
Recommendation 16 Alt 1 Version 3 – Changes in CNEL



DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 16 Alt 1 Version 3 – Changes in CNEL - Coastline

NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.



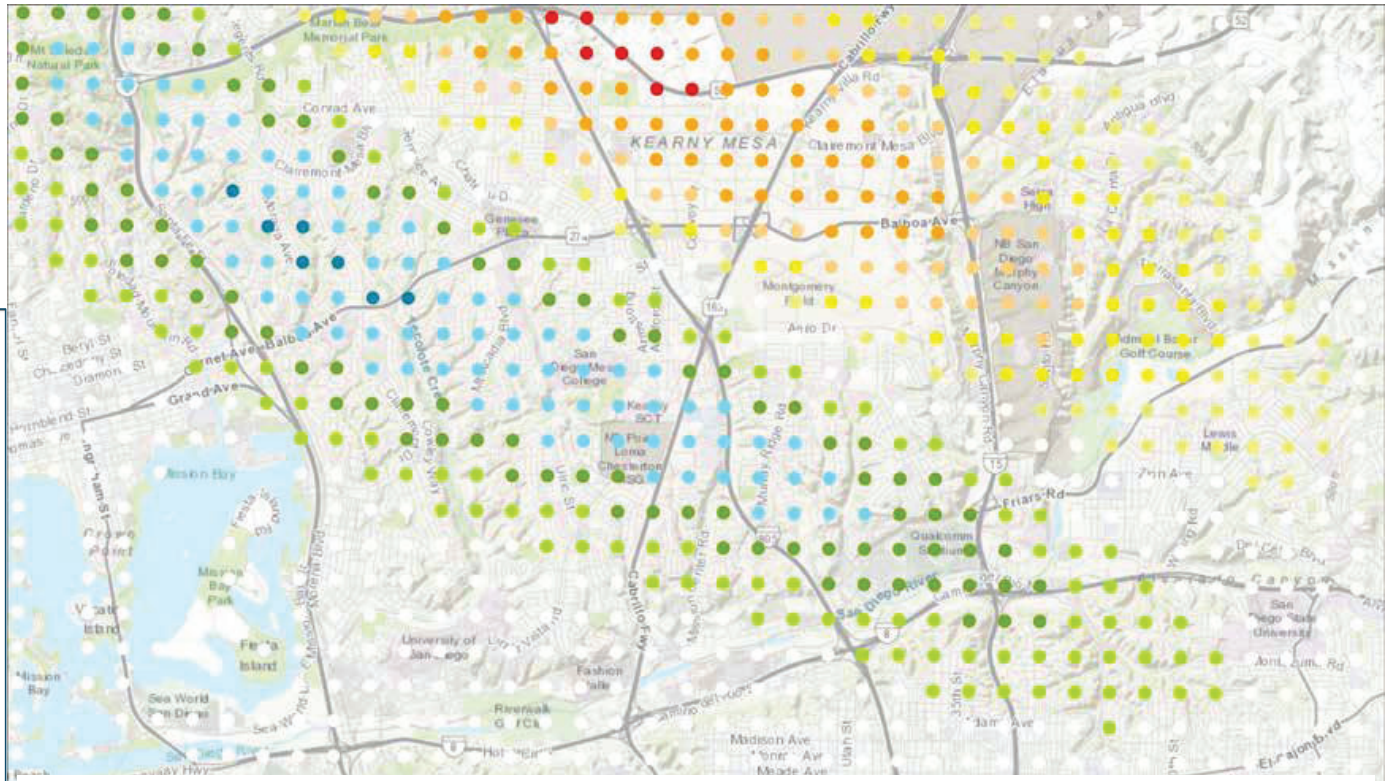
LEGEND

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 4

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 16 Alt 1 Version 3 – Changes in CNEL - Inland



LEGEND

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 4

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Recommendations

- **ANAC 14 Alternative 4** – Proceed forward for further consideration (note: would require lifting 1.5 nautical mile early turn restriction at night)
- **ANAC 15 Alternative 4** – Proceed forward for further consideration (note: would require lifting 1.5 nautical mile early turn restriction at night)
- **ANAC 15 Alternative 1** – Proceed forward for further consideration
- **ANAC 16 Alternative 1 Version 3** - Do not proceed forward due to substantial increase in noise in areas such as University City and Kearny Mesa

DRAFT Deliberative Document – For Discussion Purposes Only

Next Steps

- Present to ANAC for consideration
- ANAC to determine what to recommend to Authority Board
- Staff report to Authority Board on ANAC recommendation(s)

B.1.8 CAC AND TAC MEETING #6 – MAY 23, 2019

RICONDO®

San Diego County Regional Airport Authority (SDCRAA)
Flight Procedure Evaluation
Technical Advisory Committee and Citizen Advisory Committee Meeting #6

San Diego International Airport

May 23, 2019

DRAFT Deliberative Document – For Discussion Purposes Only

DRAFT Deliberative Document – For Discussion Purposes Only

Meeting Goals

- Present and understand the update to the noise screening results for ANAC 14 Alternatives 1 and 4 (Nighttime Departure to the Northwest – Turn at 1.5 NM or at 0.5 NM)
- Review flight procedure recommendations based on input received after March 28, 2019
- Discuss and provide input on preference to ANAC 14 Alternative 1 or 4
- Discuss consultant recommendations on ANAC 18, 19 and 20 (Early Turns and FAA Noise Dots)

DRAFT Deliberative Document – For Discussion Purposes Only

Alternative Name Change

Technical Name	Simplified Name
Recommendation 14 Alternative 1 Version 2	**Nighttime Jet Departures to the Northwest – Turn at 1.5 NM**
Recommendation 14 Alternative 4	**Nighttime Jet Departures to the Northwest – Turn at 0.5 NM**
Recommendation 15 Alternative 2 Version 2	**Nighttime Jet Departures to the East – Turn at 1.5 NM**
Recommendation 15 Alternative 4	**Nighttime Jet Departures to the East – Turn at 0.5 NM**
Recommendation 15 Alternative 1	**Jet Departures to the East (6:30 a.m. to 10:00 p.m.)**
Recommendation 16 Alternative 1 Version 3	**All Day Jet Arrivals from Northwest**

DRAFT Deliberative Document – For Discussion Purposes Only

Recommendation 14 Alt 1 and 4 –Nighttime Jet Departures to the Northwest

- The Nighttime Jet Departure is intended only for jet departures between 10:00 p.m. and 6:30 a.m.
- Previous model results included approximately 9 average daily departures to the northwest between 6:30 a.m. and 7:00 a.m. 1/
- Approximately 3 jet departures to the northwest occur between 10:00 p.m. and 6:30 a.m. on an average day.1/, 2/
- Noise screening models updated to reflect correct departure levels between 10:00 p.m. and 6:30 a.m. on proposed noise model tracks

NOTES:
1/ Based on the Authority's Airport Noise and Operations Management System (ANOMS) flight and radar data from May 2017 to December 2017.
2/ This includes a small amount of operations that occur after the departure curfew between 11:30 p.m. and 6:30 a.m.

Scenario 1 Noise Screening Update

ANAC Recommendation 14 Alternative 1 Version 2 (Nighttime Jet Departures to the Northwest – Turn at 1.5 NM) and Recommendation 15 Alternative 2 Version 2 (Nighttime Jet Departures to the East – Turn at 1.5 NM)

DRAFT Deliberative Document – For Discussion Purposes Only

Nighttime Jet Departures to the Northwest and East – Turn at 1.5 NM - AEDT Scenario 1/Baseline Noise Model Tracks and CNEL Changes

LEGEND

SAN Runway 9-27

BASELINE NOISE MODEL TRACKS

RNAV Nighttime Departure Tracks

Conventional Nighttime Departure Tracks

SCENARIO 1 NOISE MODEL TRACKS

RNAV 10:00pm to 6:30am Departure Tracks

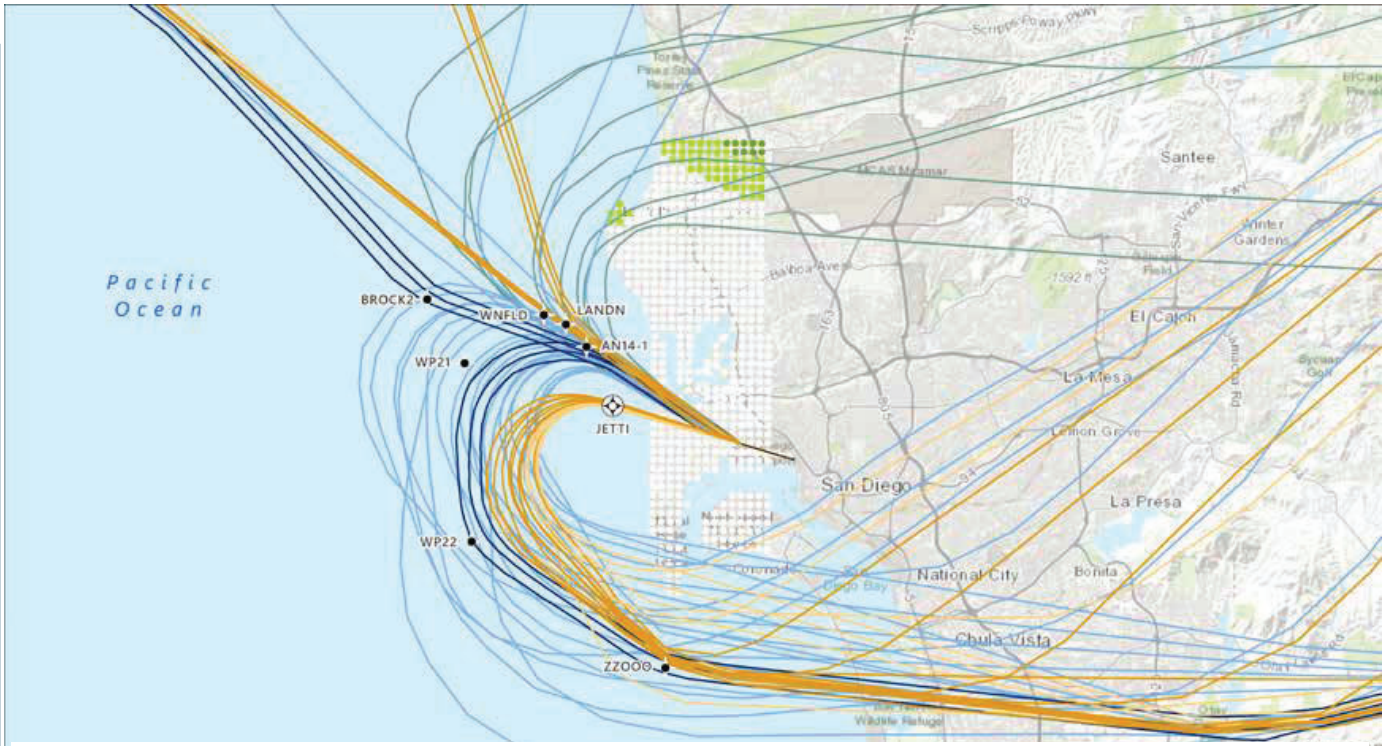
Conventional 10:00pm to 6:30am Departure Tracks

RNAV 6:30am to 7:00am Departure Tracks

Conventional 6:30am to 7:00am Departure Tracks

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 1

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

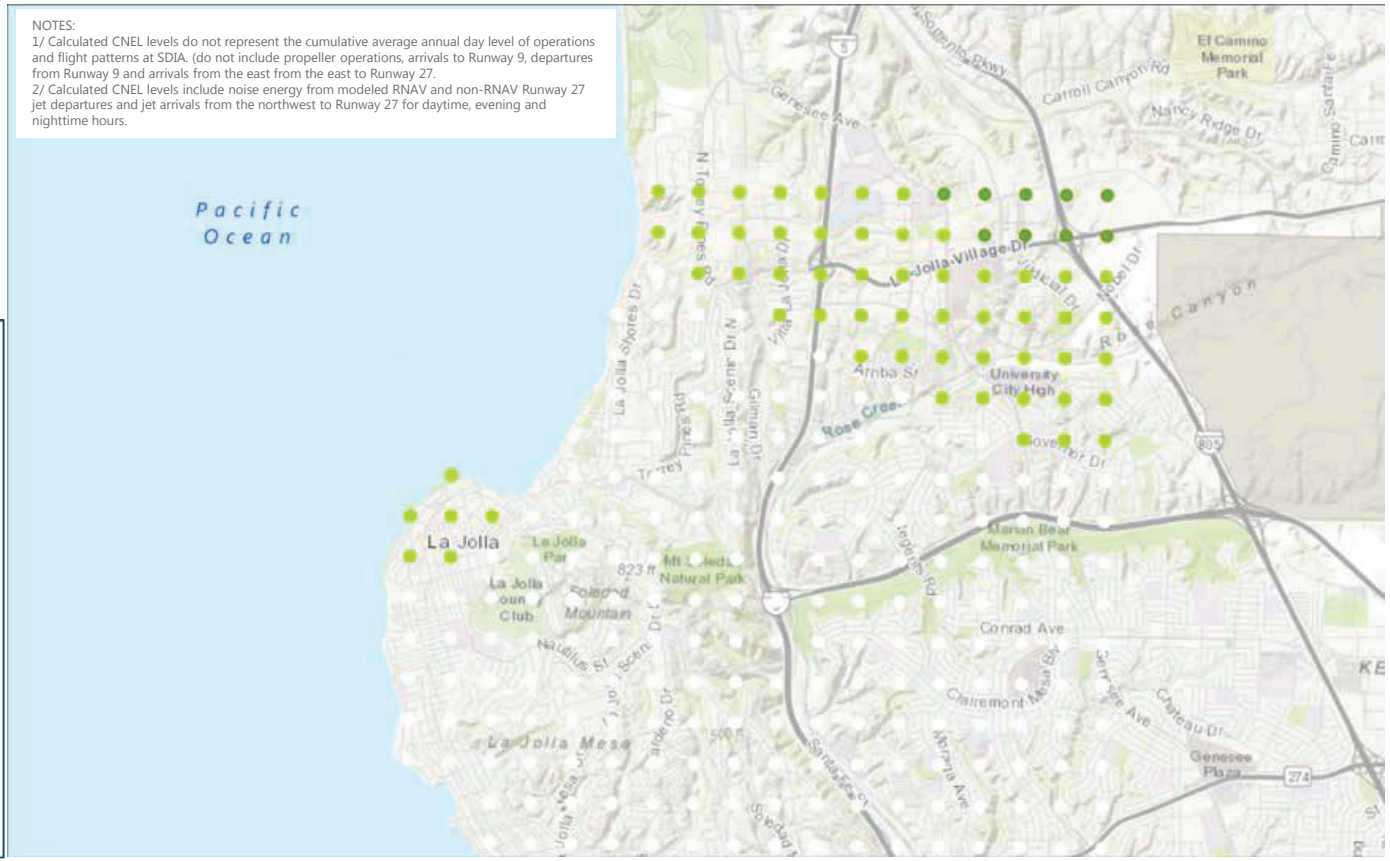


NOTES:
1/ For illustrative purposes, AEDT noise model tracks for daytime Runway 27 jet departure and arrivals from the northwest to Runway 27 were excluded to more clearly depict only the changes made to Runway 27 nighttime jet departures.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27).
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Nighttime Jet Departures to the Northwest and East – Turn at 1.5 NM – Changes in CNEL – North - UPDATE

NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.



LEGEND

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 1

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

Scenario 2 Noise Screening Update

ANAC Recommendation 14 Alternative 4 (Nighttime Jet Departures to the Northwest – Turn at 0.5 NM) and Recommendation 15 Alternative 4 (Nighttime Jet Departures to the East – Turn at 0.5 NM)

DRAFT Deliberative Document – For Discussion Purposes Only

Nighttime Jet Departures to the Northwest and East – Turn at 0.5 NM – AEDT Scenario 2/Baseline Noise Model Tracks and CNEL Changes

LEGEND

SAN Runway 9-27

BASELINE NOISE MODEL TRACKS

RNAV Nighttime Departure Tracks

Conventional Nighttime Departure Tracks

SCENARIO 2 NOISE MODEL TRACKS

RNAV 10:00pm to 6:30am Departure Tracks

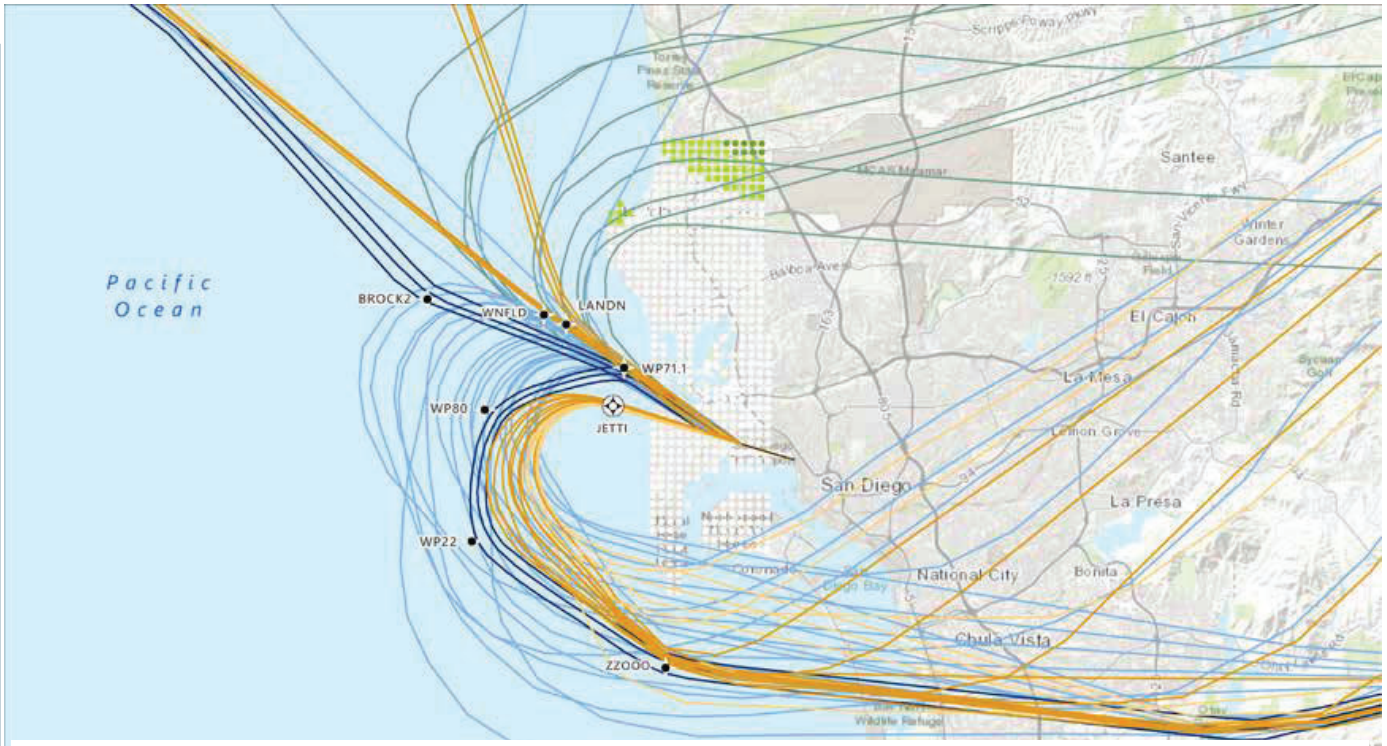
Conventional 10:00pm to 6:30am Departure Tracks

RNAV 6:30am to 7:00am Departure Tracks

Conventional 6:30am to 7:00am Departure Tracks

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 2

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

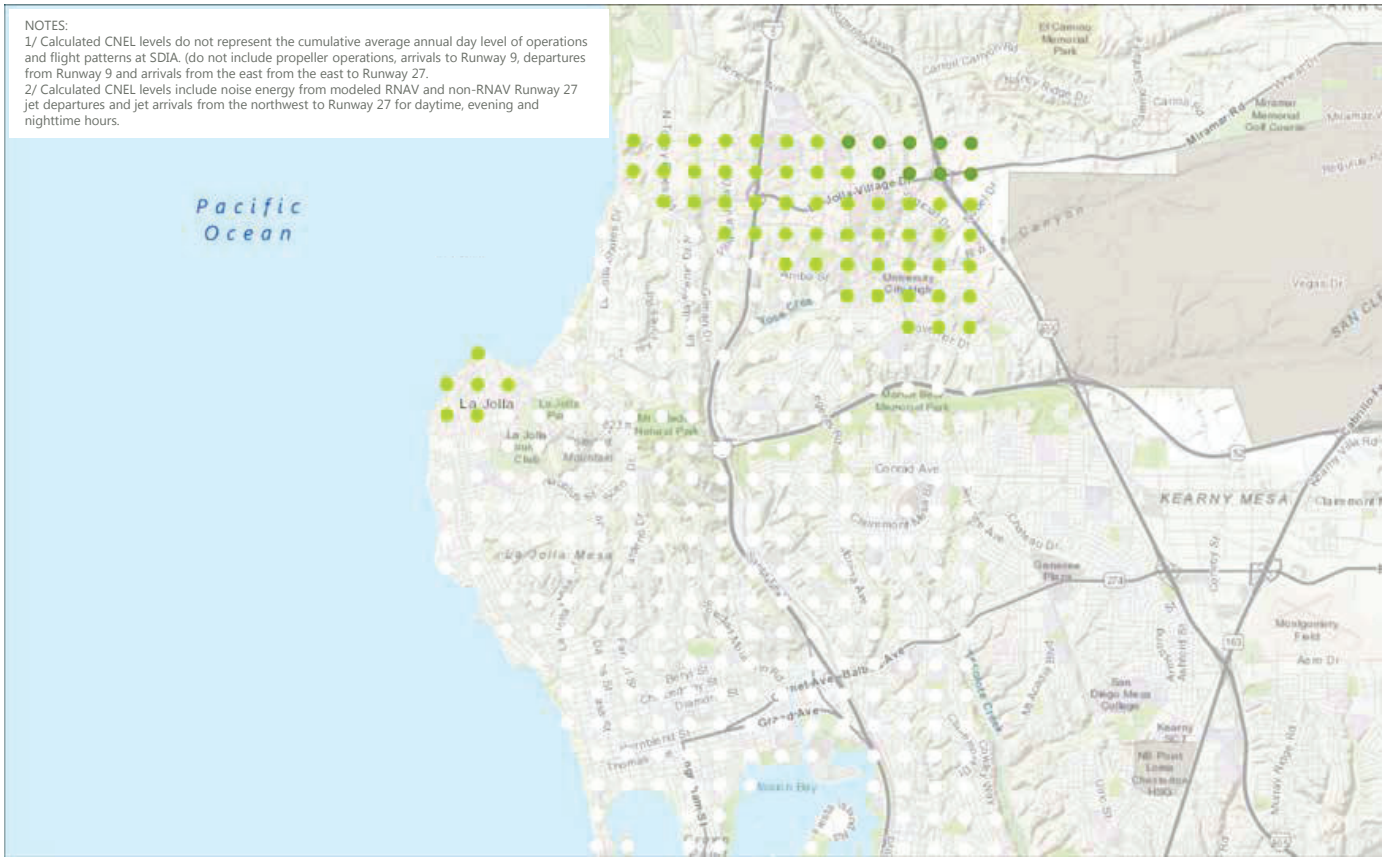


NOTES:
1/ For illustrative purposes, AEDT noise model tracks for daytime Runway 27 jet departure and arrivals from the northwest to Runway 27 were excluded to more clearly depict only the changes made to Runway 27 nighttime jet departures.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27).
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Nighttime Jet Departures to the Northwest and East – Turn at 0.5 NM – Changes in CNEL – North - UPDATE

NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.



LEGEND

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 2

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

DRAFT Deliberative Document – For Discussion Purposes Only

Consultant Recommendations - UPDATE

- **ANAC 14 Alternative 4 –Nighttime Jet Departures to the Northwest (Turn at 0.5 NM):** Hold from further consideration until ANAC Recommendation 17 and 21 analysis is completed under the Title 14 CFR Part 150 process. Adjustment to design may be required to accommodate findings for Recommendation 17 and 21.
- **ANAC 15 Alternative 4 –Nighttime Jet Departure to the East (Turn at 0.5 NM):** Hold Hold from further consideration until ANAC Recommendation 17 and 21 analysis is completed under the Title 14 CFR Part 150 process. Adjustment to design may be required to accommodate findings for Recommendation 17 and 21.
- **ANAC 15 Alternative 1 –Jet Departures to the East (6:30 a.m. to 10:00 p.m.):** Proceed forward for further consideration
- **ANAC 16 Alternative 1– All Day Jet Arrivals from Northwest**: Do not proceed forward due to substantial increase in noise in areas such as University City and Kearny Mesa

DRAFT Deliberative Document – For Discussion Purposes Only

TAC and CAC Input Required

- Jet Nighttime Departure Turn at 1.5 NM – complies with Early Turn restriction
- Jet Nighttime Departure Turn at 0.5 NM – does not comply with Early Turn restriction
- Only one of the above can be recommended

DRAFT Deliberative Document – For Discussion Purposes Only

Next Steps - UPDATE

- Present to ANAC for consideration
- ANAC make a recommendation to Authority Board

ANAC Recommendations 18, 19 and 20

Early Turns and Noise Dots

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Recommendation 18 (Early Turns)

- **ANAC Recommendation**: Review if the current definition of an early turn, define what an early turn means and conduct comparative analysis to actual flight paths
- **Consultant Finding**:
  - Runway 27 jet departures or missed approaches that are vectored off an initial departure heading prior to 1.5 nautical miles west of the shoreline or those aircraft routed back (south and east bound) over residential areas of Point Loma north of Fort Rosecrans National Cemetery, with the exception of aircraft vectored off course to ensure safe separation.
  - The Authority's methodology to identify early turns is appropriate based on independent definition of early turns, but should include missed approaches in the evaluation.

SOURCE: San Diego County Regional Airport Authority, February 2018 (noise dot locations); Ricondo & Associates, Inc., March 2019 (early turn violation example paths).

ANAC Recommendation 19 (Early Turns)

- **ANAC Recommendation**: Work with FAA/ATC to modify flight procedures to increase compliance and reduce early turns, with consideration of aircraft performance.
- **Consultant Finding**: The consultant reviewed all published departure procedures and concluded the designs comply with the early turn restriction. The early turn violations reported by the Authority to ANAC serve as evidence the existing procedures as defined increase compliance with early turn restrictions. In addition, the intent of this recommendation (to modify procedures to increase compliance) is met through the design evaluation efforts related to Recommendations 14 and 15.

Note: FAA air traffic control manages a very dynamic environment close to and several miles away from SDIA. They direct flights to address weather, safe separation, sequencing and/or operational efficiency issues present at the time an air traffic controller takes action. In many cases, management actions are related to traffic interaction several miles away from SDIA. Procedure designs cannot address every situation that requires speed or heading directions issued by a controller.

Early Turns by Year

YEAR	Early Turns	% Change
2013	829	--
2014	1,105	33
2015	1,293	17
2016	776	(40)
2017	420	(46)
2018	269	(36)
2019	125*	--

*Through March 31, 2019

ZZOOO RNAV SID implemented November 2016 and PADRZ RNAV SID implemented January 2017

SOURCE: San Diego County Regional Airport Authority, April 2019.

RNAV Use – May-December 2017

Runway 27 RNAV SIDs	Use (%)
ZZOOO RNAV	81%
PADRZ RNAV	96%

SOURCE: Ricondo & Associates, Inc., April 2019 (based on SDCRAA ANOMS radar data from May 2017 to December 2017 and maintaining RNAV path until ZZOOO or WNFLD waypoints).

ANAC Recommendation 20 (Noise Dots)

- **ANAC Recommendation**: FAA\TRACON to incorporate Red Dot waypoint locations into current and future SID's as part of the formal SID and STAR Procedures, so that Red Dots become waypoints on departure procedures and data is collected on waypoints.
- **Consultant Finding**: Incorporating noise dots as waypoints in existing or proposed SIDs is not feasible. The current Area Navigation (RNAV) departures comply with the early-turn restrictions. The focus should be to work with FAA on keeping aircraft on the RNAV departure procedures. An alternative concept to move Noise Dots #3 and #4 south of Point Loma was considered, but most likely will not be feasible based on preliminary feedback from FAA.

SOURCE: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, OpenStreetMap Contributors, and the GIS User Community, August 2018 (basemap); San Diego County Regional Airport Authority ANOMS data, 2018 (FAA noise dots); ESRI Data, 2010 (Airports); National Flight Data Center (NFDC), October 2018 (waypoint); Ricondo & Associates, Inc., October 2018 (alternatives).

B.1.9 ANAC– JUNE 19, 2019

RICONDO®

San Diego County Regional Airport Authority (SDCRAA)
Flight Procedure Evaluation
ANAC Information Briefing

San Diego International Airport

June 19, 2019

DRAFT Deliberative Document – For Discussion Purposes Only

DRAFT Deliberative Document – For Discussion Purposes Only

Agenda

- ANAC Recommendations for Traffic Procedures
- Traffic Procedure Evaluation Overview
- Final Procedure Design Concept Details
- Early Turn and Noise Dot Evaluation
- Requested Actions for Consideration

ANAC Recommendations for Air Traffic Procedures

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Recommendations

14 Revise PADRZ or create a new procedure to reduce increased noise in La Jolla, Mission Beach and Pacific Beach.

15 Revise ZZOOO to significantly reduce or eliminate flights over the Point Loma Peninsula and reduce or eliminate eastbound turns over La Jolla

16 Reassess and revise the entire arrival corridor in a manner that more appropriately "shares the noise"

17 Determine methods to increase current compliance in Nighttime Noise Abatement Procedures to improve noise impacts for affected communities

18 Review current definition of an early turn, define what an early turn means and conduct comparative analysis to actual flight paths

19 Work with FAA/ATC to modify flight procedures to increase compliance and reduce early turns, with consideration of aircraft performance.

20 FAA\TRACON to incorporate Red Dot waypoint locations into current and future SID's as part of the formal SID and STAR Procedures, so that Red Dots become waypoints on departure procedures

21 Conduct an engineering analysis of modification to the Noise Abatement Departure Procedure to assess the potential improvement to noise contours around the airport.

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Recommendation Groupings

- Traffic Procedures – ANAC 14, 15, 16, 17 and 21
- Early Turns and Noise Dots – ANAC 18, 19 and 20

Traffic Procedure Evaluation Overview

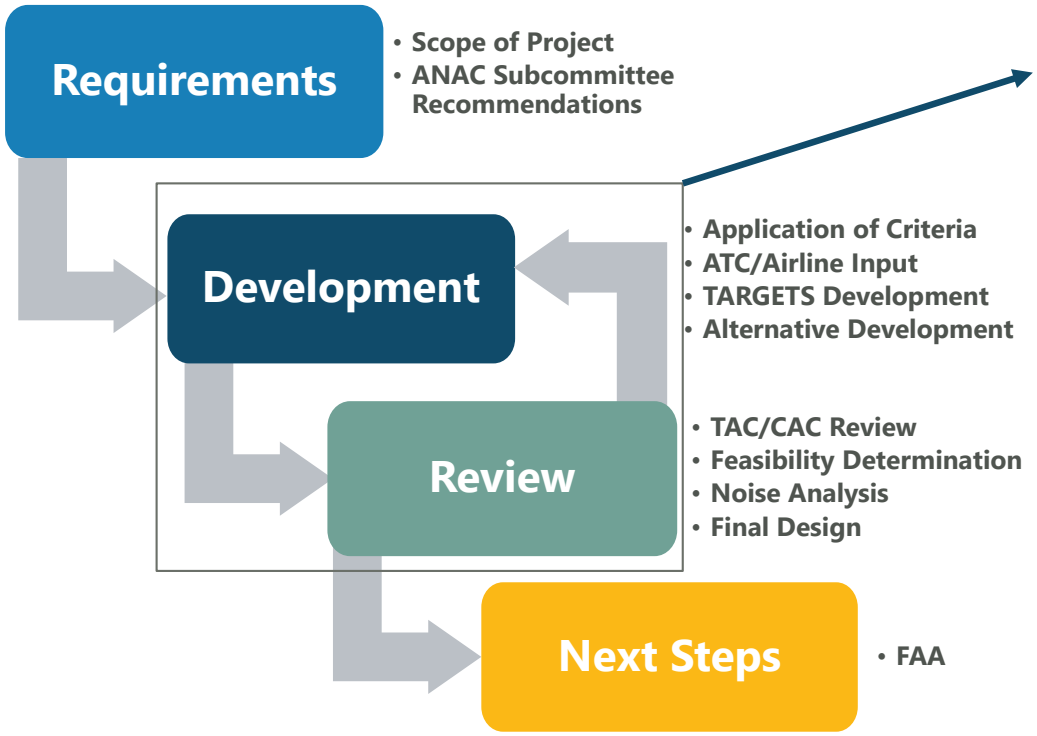
DRAFT Deliberative Document – For Discussion Purposes Only

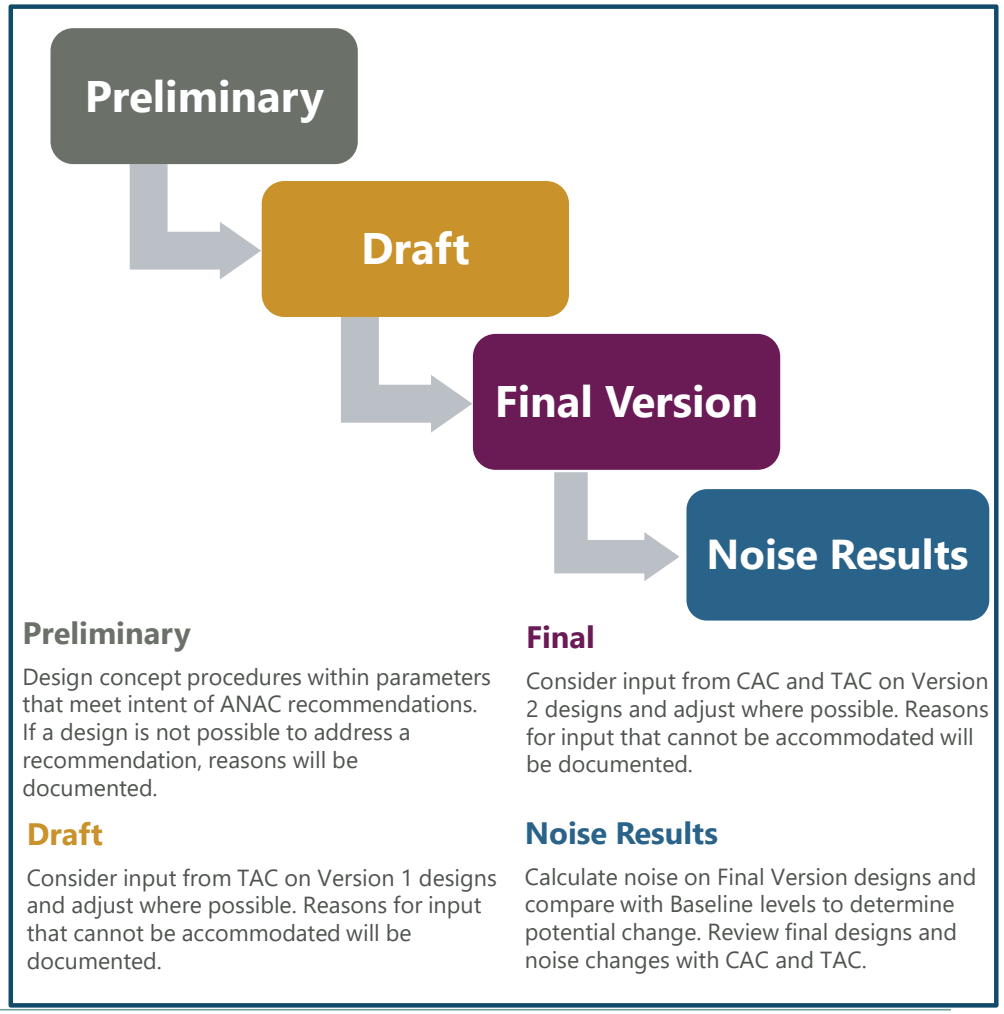
Evaluation Objectives

- Meet ANAC recommendation intent
- Determine feasibility
  - Safe
  - Meet FAA design criteria
  - Comply with FAA ATC Rules, Policies, and Procedures
  - Maintain SDIA airfield capacity
  - Consider FAA mission and goals
- Calculate and assess changes in noise
- Provide consultant recommendations to SDCRAA and ANAC

DRAFT Deliberative Document – For Discussion Purposes Only

Evaluation Process





Preliminary

Design concept procedures within parameters that meet intent of ANAC recommendations. If a design is not possible to address a recommendation, reasons will be documented.

Draft

Consider input from TAC on Version 1 designs and adjust where possible. Reasons for input that cannot be accommodated will be documented.

Final

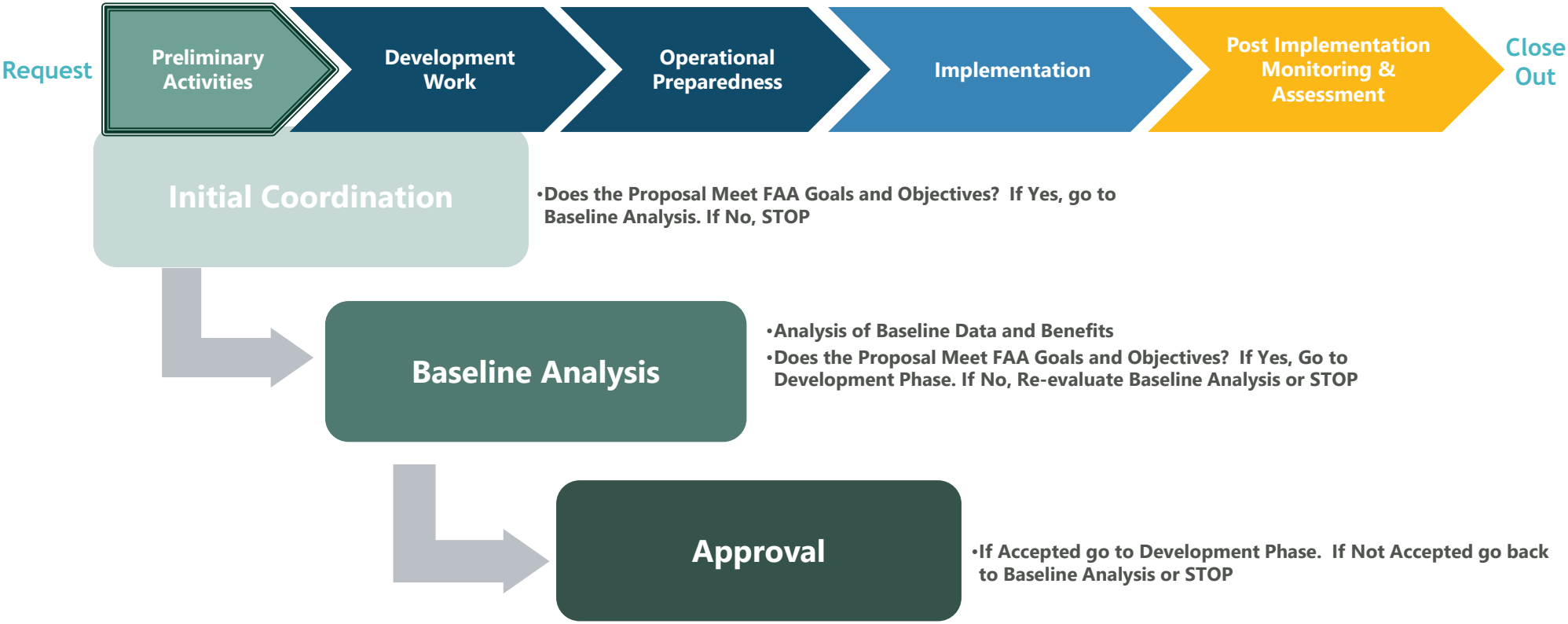
Consider input from CAC and TAC on Version 2 designs and adjust where possible. Reasons for input that cannot be accommodated will be documented.

Noise Results

Calculate noise on Final Version designs and compare with Baseline levels to determine potential change. Review final designs and noise changes with CAC and TAC.

DRAFT Deliberative Document – For Discussion Purposes Only

FAA Evaluation Process



DRAFT Deliberative Document – For Discussion Purposes Only

Technical and Citizen Advisory Committee Input/Feedback

- Citizen Advisory Committee (CAC)
  - Input on ANAC recommendations and related goals
  - Input on procedure design concepts
- Technical Advisory Committee (TAC)
  - Broader stakeholder group: Airline(s), commuter carrier(s), corporate operator(s) and FAA ATO.
  - Input to confirm procedures are operationally viable and identify potential issues

DRAFT Deliberative Document – For Discussion Purposes Only

Input/Feedback Process Summary

- Coordinated with TAC and CAC
  - Conducted 6 meetings related to traffic procedure evaluations
  - Provided responses to comments between Preliminary Draft and Draft phases
- Shared information to the public
  - TAC/CAC meetings open for public to observe
  - Shared all presentations with public on the website (https://www.san.org/Airport-Noise/FAR-Part-150?EntryId=12485)

DRAFT Deliberative Document – For Discussion Purposes Only

Design Parameters

- Do not change aircraft flight paths over areas exposed to CNEL 65 or higher
- Do not impact safety
- Meet FAA design criteria
- Fit within existing airspace and maintain existing airspace hand-off areas
- Do not impact capacity of SDIA
- Do not move noise to new non-compatible areas

Evaluation Actions

Did:

- Propose designs compatible with existing air traffic environment
- Gather critical input from CAC and TAC during design process
- Coordinate with FAA ATO staff during concept design process
- Develop information for FAA consideration during the "Preliminary Activities" phase of the FAA Order 7100.41a process, if necessary
- Calculate change in noise levels for specific procedures

Evaluation Actions

✕ Did not:

- Evaluate recommendations to reduce noise at or higher than CNEL 65 dBA – reserved for Part 150 Study
- Propose designs that require FAA waivers
- Propose designs that will negatively impact SDIA capacity
- Conduct all steps in FAA Order 7100.41A
- Evaluate non-SDIA traffic overflights
- Evaluate "restriction" type proposals that require 14 CFR Part 161 study

DRAFT Deliberative Document – For Discussion Purposes Only

Potential Affect to CNEL 65

- Change to initial departure headings from Runway 27
  - Recommendation 17 – Nighttime Noise Abatement Procedure
  - Recommendation 21 - Modification to the Noise Abatement Departure Procedure
- **Consultant Recommendation**: Evaluate recommended changes under Title 14 Code of Federal Regulations Part 150 Study (14 CFR Part 150 Study) update

DRAFT Deliberative Document – For Discussion Purposes Only

Design Concept Evaluation Results Summary

ANAC Recommendations	Design Concepts Evaluated	14 CFR Part 150 Process	Final Design Concept
Recommendation 14 – Departures to the Northwest	8	2	2
Recommendation 15 – Departures to the East	6	1	3
Recommendation 16 - Arrivals from the Northwest	6	0	0
Total	20	3	5

DRAFT Deliberative Document – For Discussion Purposes Only

Final Design Concepts Evaluated

ANAC Recommendation	Alternative Name
Recommendation 14	**Nighttime Jet Departures to the Northwest – Turn at 1.5 NM**
Recommendation 14	**Nighttime Jet Departures to the Northwest – Turn at 0.5 NM**
Recommendation 15	**Nighttime Jet Departures to the East – Turn at 1.5 NM**
Recommendation 15	**Nighttime Jet Departures to the East – Turn at 0.5 NM**
Recommendation 15	**Jet Departures to the East (6:30 a.m. to 10:00 p.m.)**
Recommendation 16	**All Day Jet Arrivals from Northwest**

DRAFT Deliberative Document – For Discussion Purposes Only

TAC/CAC Input on Final Design Concepts

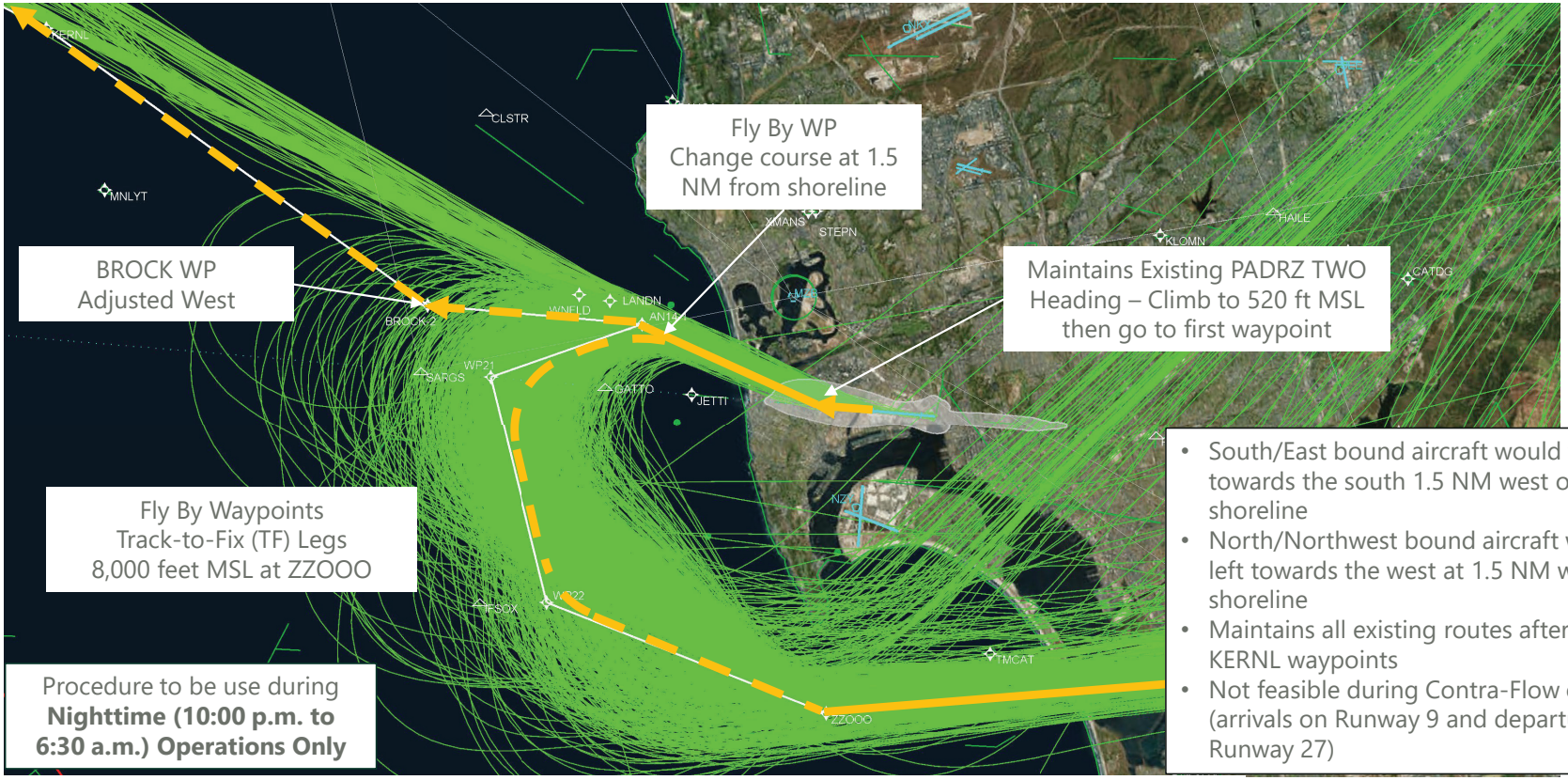
- Prefer Early Turn restriction (no turns until 1.5 NM from shoreline) is maintained in all designs
  - Did not recommend Nighttime Jet Departures to the Northwest – Turn at 0.5 NM
  - Did not recommend Nighttime Jet Departures to the East – Turn at 0.5 NM
- Hold nighttime departure procedure design concepts until ANAC Recommendation 17 and 21 are addressed in 14 CFR Part 150 Study

Final Procedure Design Concept Details

DRAFT Deliberative Document – For Discussion Purposes Only

Nighttime Jet Departures to the Northwest and East – Turn at 1.5 NM

Fly By Waypoint



- South/East bound aircraft would turn left towards the south 1.5 NM west of the shoreline
- North/Northwest bound aircraft would turn left towards the west at 1.5 NM west of the shoreline
- Maintains all existing routes after ZZOOO and KERNL waypoints
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

NOTE: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

DRAFT Deliberative Document – For Discussion Purposes Only

Nighttime Jet Departures to the Northwest and East – Turn at 1.5 NM - AEDT Scenario 1/Baseline Noise Model Tracks and CNEL Changes

LEGEND

- SAN Runway 9-27

BASELINE NOISE MODEL TRACKS

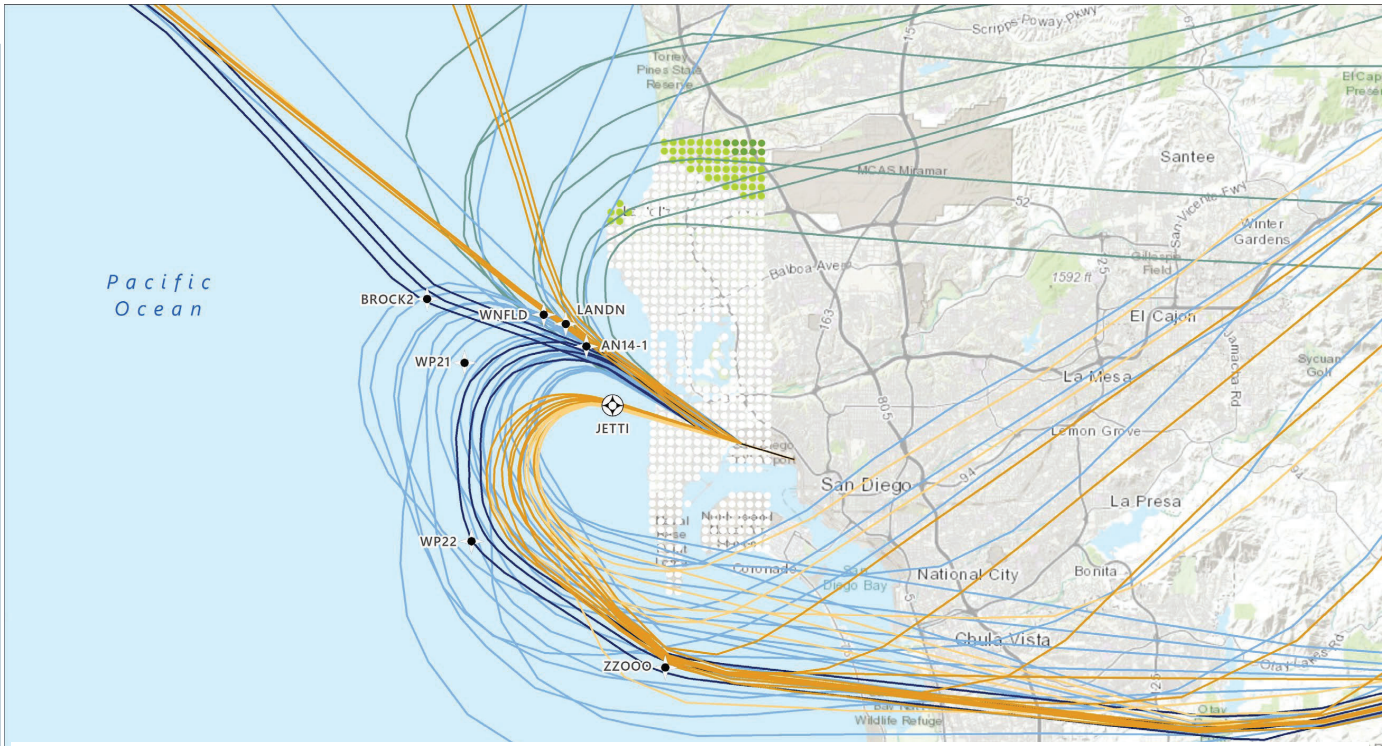
- RNAV Nighttime Departure Tracks
- Conventional Nighttime Departure Tracks

SCENARIO 1 NOISE MODEL TRACKS

- RNAV 10:00pm to 6:30am Departure Tracks
- Conventional 10:00pm to 6:30am Departure Tracks
- RNAV 6:30am to 7:00am Departure Tracks
- Conventional 6:30am to 7:00am Departure Tracks

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 1

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

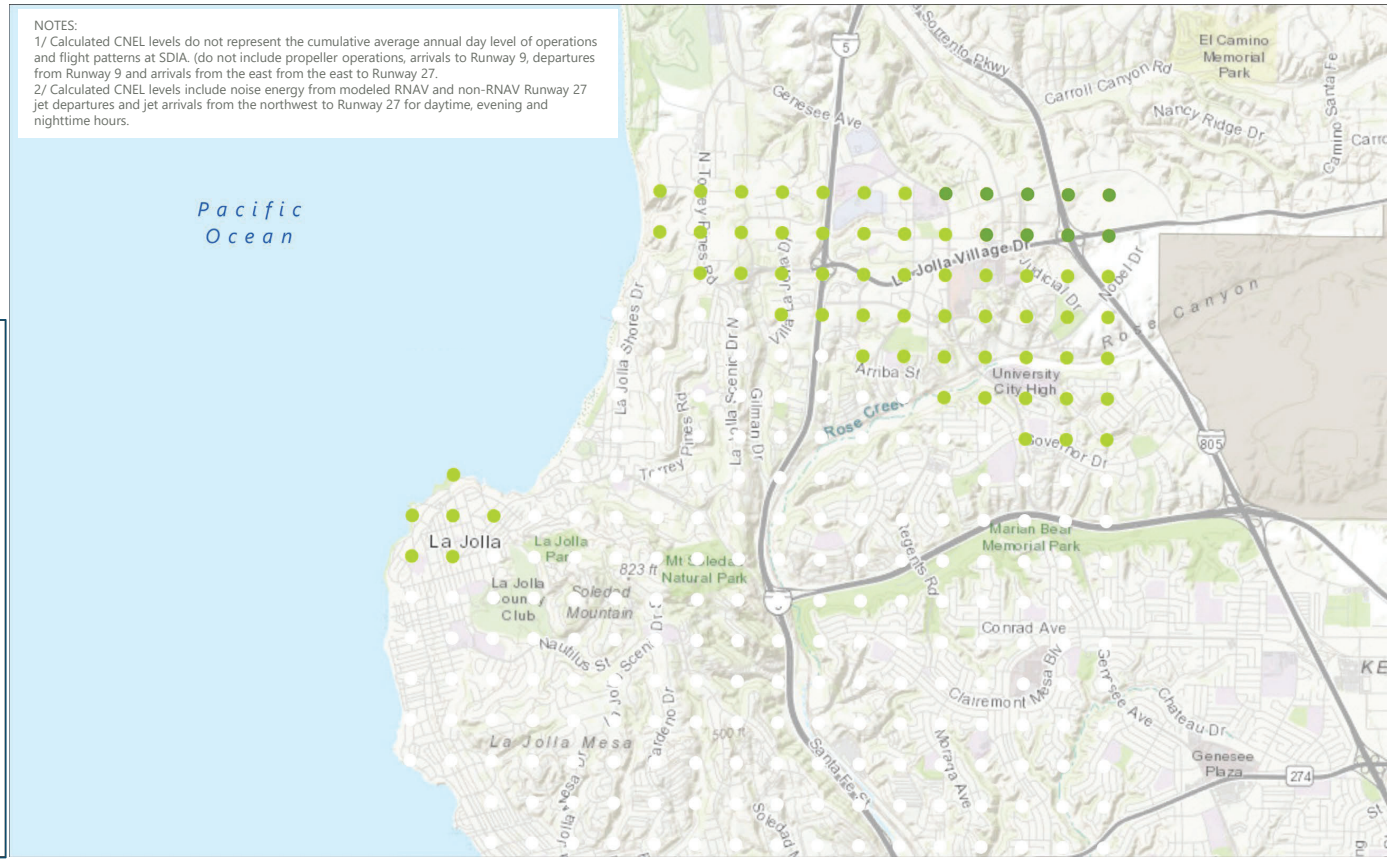


NOTES:
1/ For illustrative purposes, AEDT noise model tracks for daytime Runway 27 jet departure and arrivals from the northwest to Runway 27 were excluded to more clearly depict only the changes made to Runway 27 nighttime jet departures.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27).
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Nighttime Jet Departures to the Northwest and East – Turn at 1.5 NM – Changes in CNEL – North - UPDATE

NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.



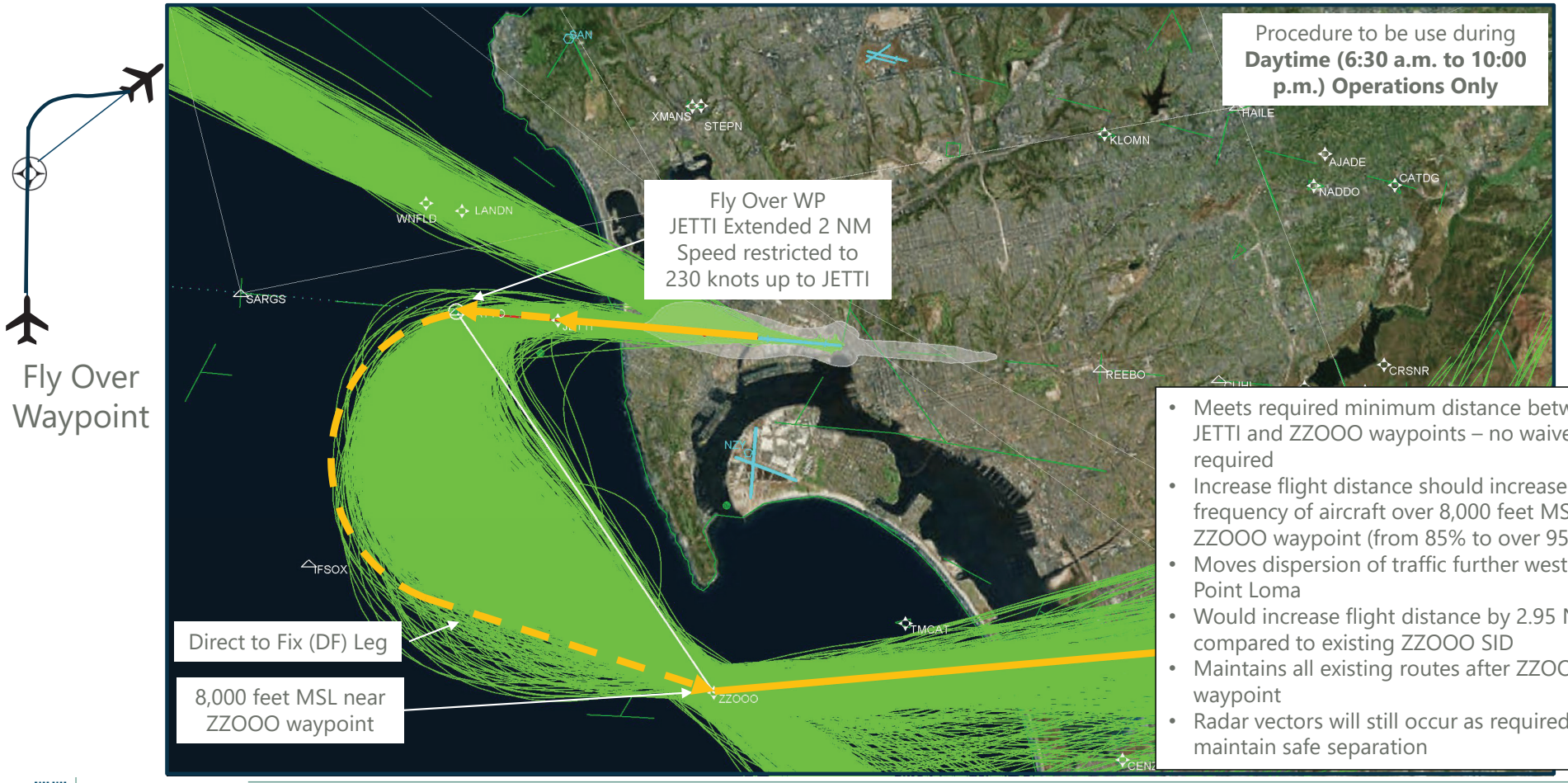
LEGEND

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 1

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

DRAFT Deliberative Document – For Discussion Purposes Only

Jet Departures to the East (6:30 a.m. to 10:00 p.m.)



DRAFT Deliberative Document – For Discussion Purposes Only

Jet Departures to the East (6:30 a.m. to 10:00 p.m.)
AEDT Alternative/Baseline Noise Model Tracks and CNEL Changes

LEGEND

SAN Runway 9-27

BASELINE NOISE MODEL TRACKS

RNAV Nighttime Departure Tracks

Conventional Nighttime Departure Tracks

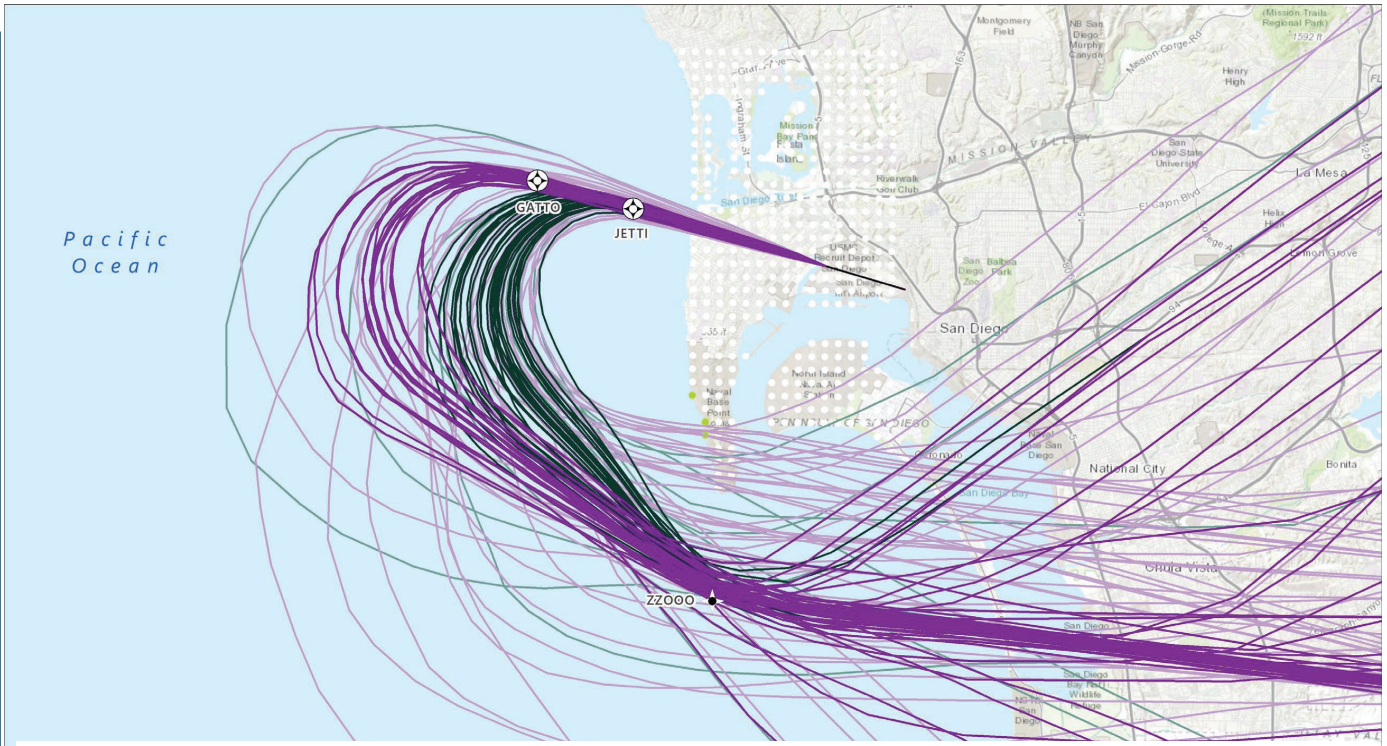
SCENARIO 2 NOISE MODEL TRACKS

RNAV Nighttime Departure Tracks

Conventional Nighttime Departure Tracks

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 2

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB



NOTES:
1/ For illustrative purposes, AEDT noise model tracks for Runway 27 jet departures that turn right from Runway 27 then head to the north/northwest or south then east and arrivals from the northwest to Runway 27 were excluded to more clearly depict only the changes made to Runway 27 jet departures that turn left to the south and then to the east.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

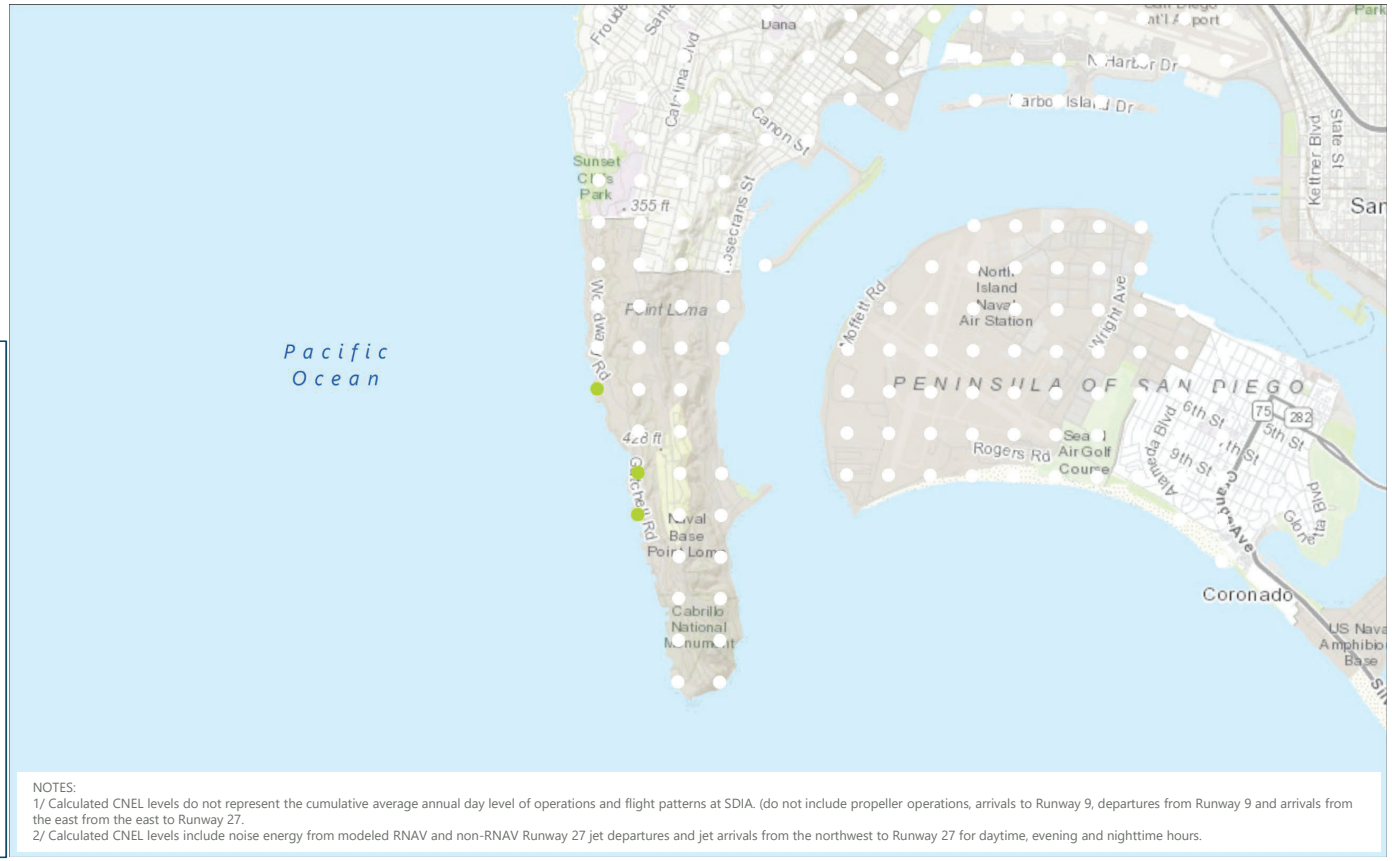
DRAFT Deliberative Document – For Discussion Purposes Only

Jet Departures to the East (6:30 a.m. to 10:00 p.m.) - Changes in CNEL - South

LEGEND

CNEL CHANGES BETWEEN BASELINE AND SCENARIO 3

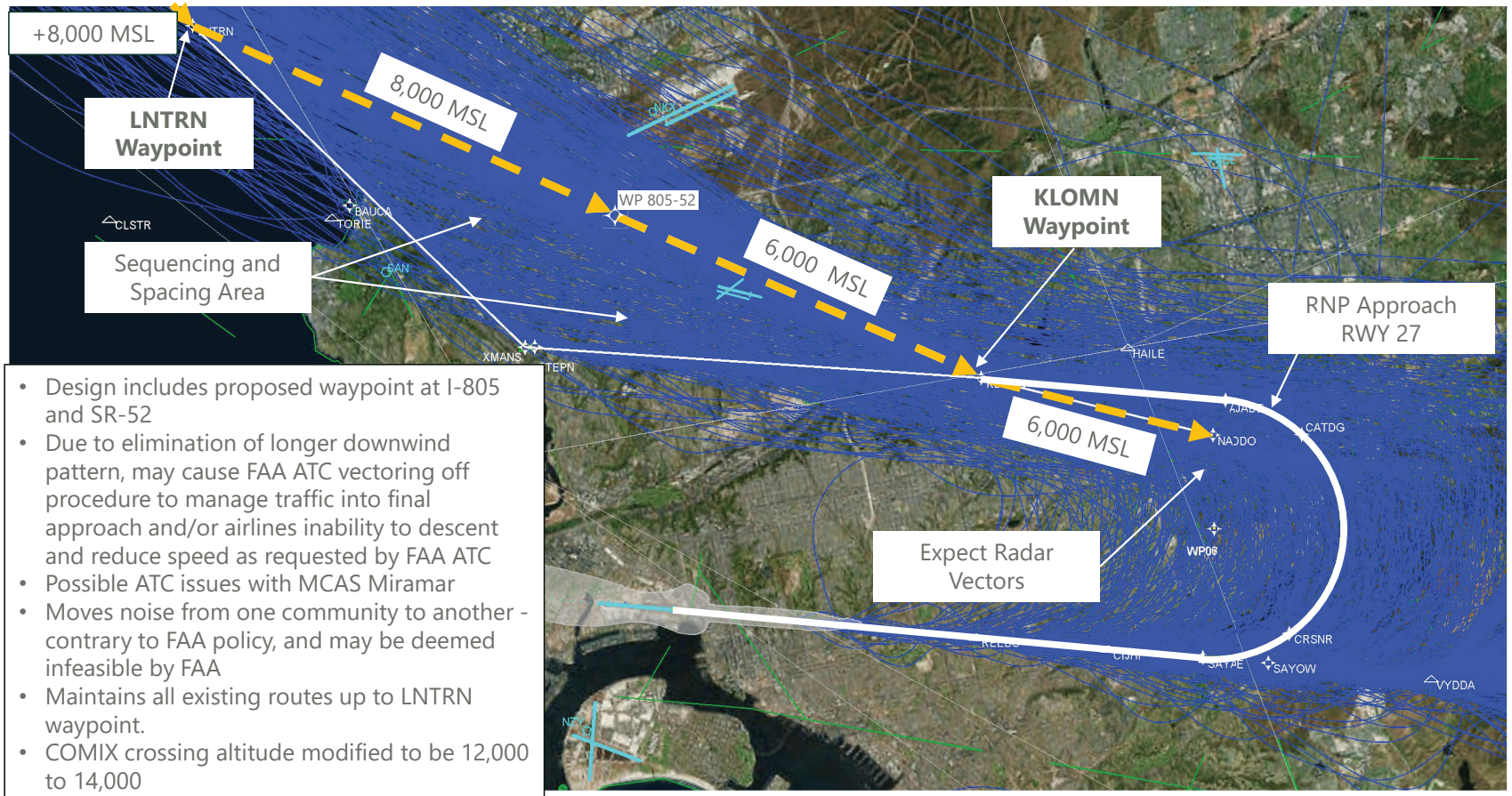
- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

All Day Jet Arrivals from the Northwest

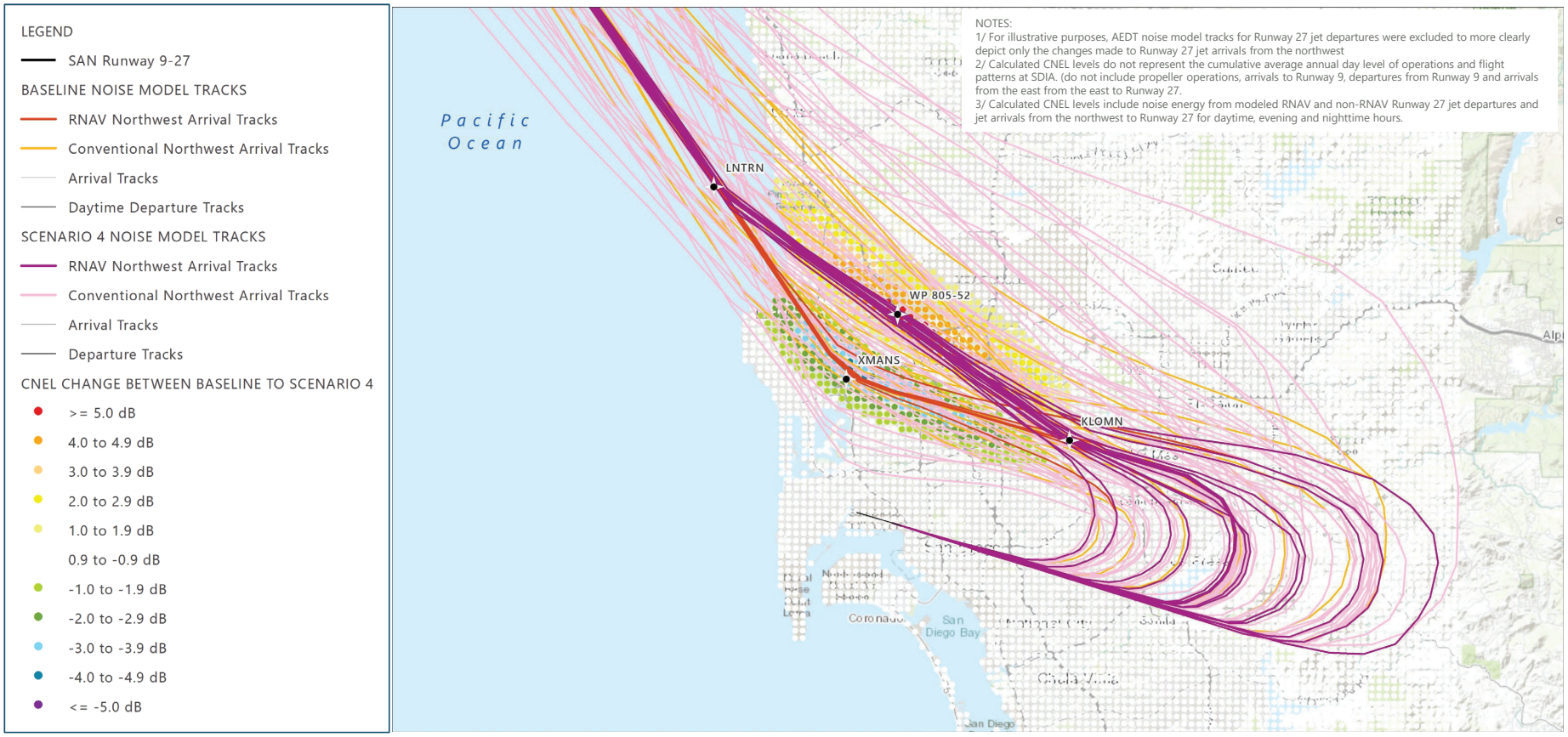


- Design includes proposed waypoint at I-805 and SR-52
- Due to elimination of longer downwind pattern, may cause FAA ATC vectoring off procedure to manage traffic into final approach and/or airlines inability to descent and reduce speed as requested by FAA ATC
- Possible ATC issues with MCAS Miramar
- Moves noise from one community to another - contrary to FAA policy, and may be deemed infeasible by FAA
- Maintains all existing routes up to LNTRN waypoint.
- COMIX crossing altitude modified to be 12,000 to 14,000
- Reduces the flight track 1 NM

NOTE: White lines connecting waypoint to waypoint may not represent actual flight path flown by aircraft.

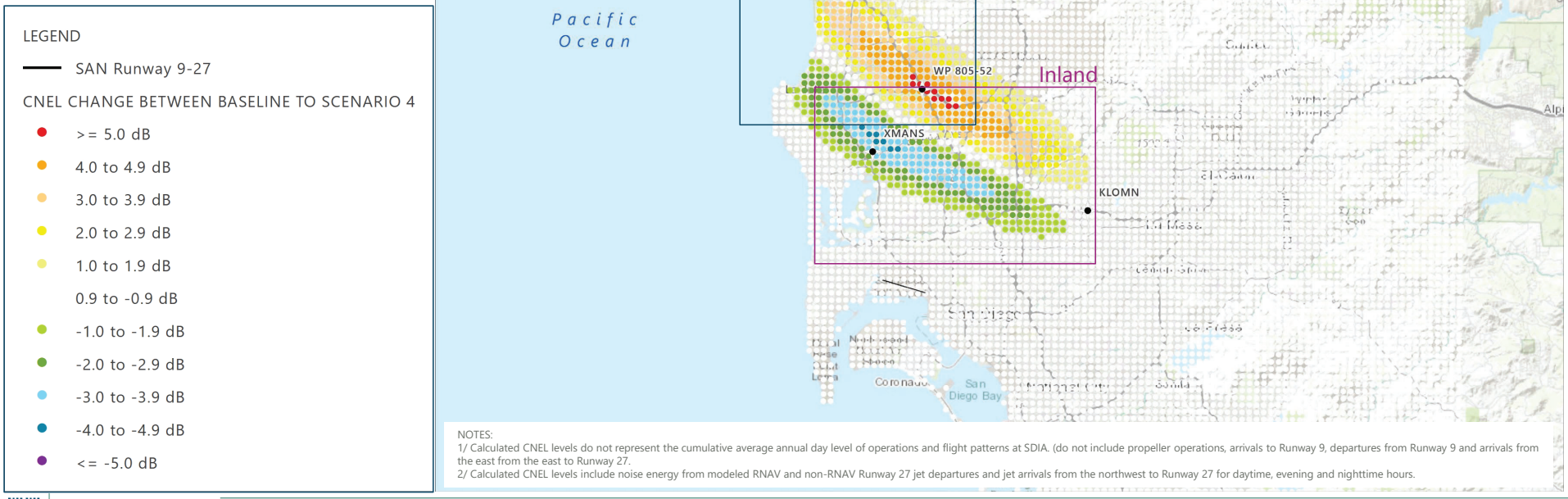
DRAFT Deliberative Document – For Discussion Purposes Only

All Day Jet Arrivals from the Northwest – AEDT Alternative/Baseline Noise Model Tracks and CNEL Changes



DRAFT Deliberative Document – For Discussion Purposes Only

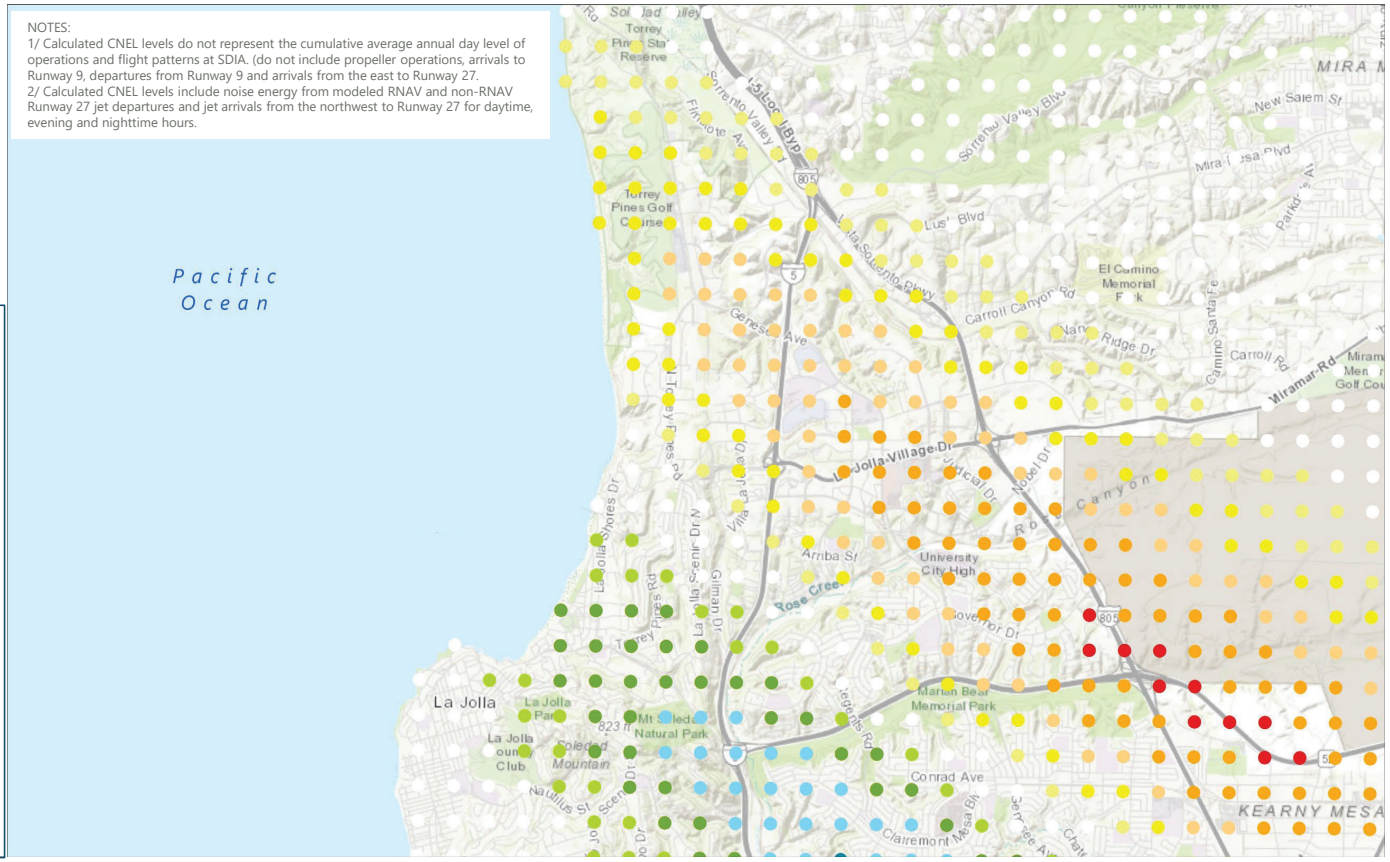
All Day Jet Arrivals from the Northwest – Changes in CNEL



DRAFT Deliberative Document – For Discussion Purposes Only

All Day Jet Arrivals from the Northwest – Changes in CNEL - Coastline

NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east to Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.



LEGEND

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 4

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

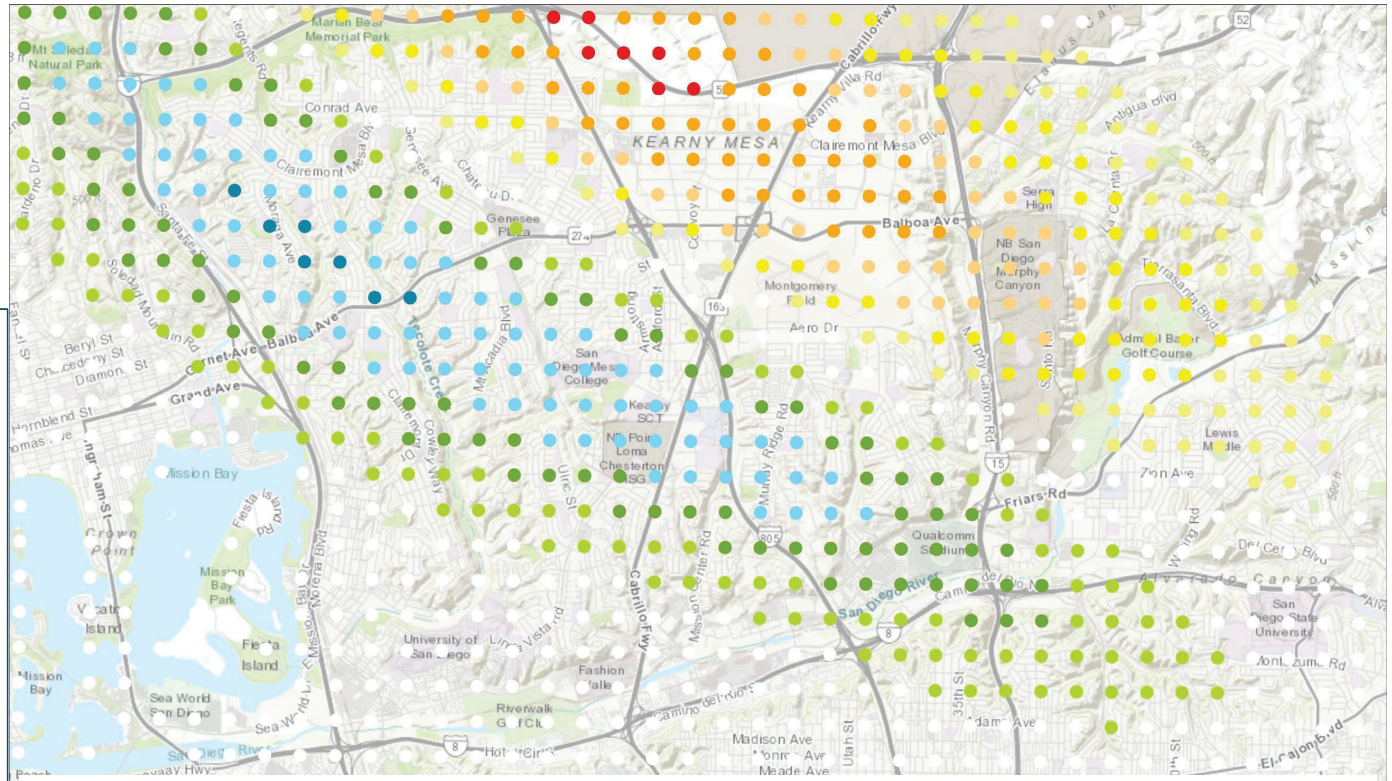
DRAFT Deliberative Document – For Discussion Purposes Only

All Day Jet Arrivals from the Northwest – Changes in CNEL - Inland

LEGEND

CNEL CHANGE BETWEEN BASELINE TO SCENARIO 4

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and arrivals from the east
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet departures and jet arrivals from the northwest to Runway 27 for daytime, evening and nighttime hours.

DRAFT Deliberative Document – For Discussion Purposes Only

Consultant Recommendations

- Evaluate Nighttime Noise Abatement Departure changes (ANAC 17 and 21) under 14 CFR Part 150 Study update
- Hold nighttime departure procedure design concept for ANAC 14 and 15 until ANAC 17 and 21 are addressed in 14 CFR Part 150 Study
- Proceed forward with the Jet Departures to the East (6:30 a.m. to 10:00 p.m.) design concept
- Do **not** proceed forward with the All Day Jet Arrivals from the Northwest design concept

Early Turn and Noise Dot Evaluation

DRAFT Deliberative Document – For Discussion Purposes Only

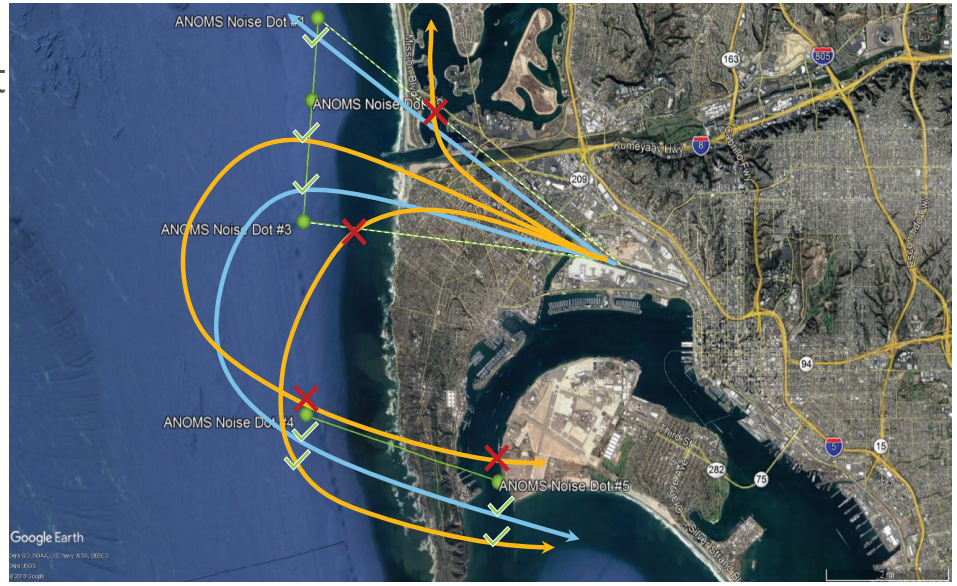
Early Turn and Noise Dot Evaluation

- **Recommendation 18** – *Early Turn* - 3rd Party review and definition of "Early Turn"
- **Recommendation 19** – *Early Turn* - Modify flight procedures to increase compliance and reduce early turns
- **Recommendation 20** – *Noise Dots* - Incorporate Red Dot waypoint locations into current and future SID's as part of the formal SID and STAR Procedures
- **Status**: Consultant Team completed findings report and was distributed to TAC and CAC members and posted at the website on March 21, 2019

DRAFT Deliberative Document – For Discussion Purposes Only

ANAC Recommendation 18 (Early Turns)

- **ANAC Recommendation**: Review current definition of an early turn, define what an early turn means and conduct comparative analysis to actual flight paths
- **Consultant Finding**:
  - Runway 27 jet departures or missed approaches that are vectored off an initial departure heading prior to 1.5 nautical miles west of the shoreline or those aircraft routed back (south and east bound) over residential areas of Point Loma north of Fort Rosecrans National Cemetery, with the exception of aircraft vectored off course to ensure safe separation.
  - The Authority's methodology to identify early turns is appropriate based on independent definition of early turns, but should include missed approaches in the evaluation.



SOURCE: San Diego County Regional Airport Authority, February 2018 (noise dot locations); Ricondo & Associates, Inc., March 2019 (early turn violation example paths).

ANAC Recommendation 19 (Early Turns)

- **ANAC Recommendation**: Work with FAA/ATC to modify flight procedures to increase compliance and reduce early turns, with consideration of aircraft performance.
- **Consultant Finding**: The consultant reviewed all published departure procedures and concluded the designs comply with the early turn restriction. The early turn violations reported by the Authority to ANAC serve as evidence the existing procedures as defined increase compliance with early turn restrictions. In addition, the intent of this recommendation (to modify procedures to increase compliance) is met through the design evaluation efforts related to Recommendations 14 and 15.

Note: FAA air traffic control manages a very dynamic environment close to and several miles away from SDIA. They direct flights to address weather, safe separation, sequencing and/or operational efficiency issues present at the time an air traffic controller takes action. In many cases, management actions are related to traffic interaction several miles away from SDIA. Procedure designs cannot address every situation that requires speed or heading directions issued by a controller.

Early Turns by Year

YEAR	Early Turns	% Change
2013	829	--
2014	1,105	33
2015	1,293	17
2016	776	(40)
2017	420	(46)
2018	269	(36)
2019	125*	--

* Through March 31, 2019

ZZOOO RNAV SID implemented November 2016 and PADRZ RNAV SID implemented January 2017

SOURCE: San Diego County Regional Airport Authority, April 2019.

RNAV Use – May-December 2017

Runway 27 RNAV SIDs	Use (%)
ZZOOO RNAV	81%
PADRZ RNAV	96%

SOURCE: Ricondo & Associates, Inc., April 2019 (based on SDCRAA ANOMS radar data from May 2017 to December 2017 and maintaining RNAV path until ZZOOO or WNFLD waypoints).

ANAC Recommendation 20 (Noise Dots)

- **ANAC Recommendation**: FAA\TRACON to incorporate Red Dot waypoint locations into current and future SID's as part of the formal SID and STAR Procedures, so that Red Dots become waypoints on departure procedures and data is collected on waypoints.
- **Consultant Finding**: Incorporating noise dots as waypoints in existing or proposed SIDs is not feasible. The current Area Navigation (RNAV) departures comply with the early-turn restrictions. The focus should be to work with FAA on keeping aircraft on the RNAV departure procedures. An alternative concept to move Noise Dots #3 and #4 south of Point Loma was considered, but most likely will not be feasible based on preliminary feedback from FAA.

SOURCE: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, OpenStreetMap Contributors, and the GIS User Community, August 2018 (basemap); San Diego County Regional Airport Authority ANOMS data, 2018 (FAA noise dots); ESRI Data, 2010 (Airports); National Flight Data Center (NFDC), October 2018 (waypoint); Ricondo & Associates, Inc., October 2018 (alternatives).

Requested Actions for Consideration

Requested Actions for Consideration

- **Nighttime Jet Departures to the Northwest and East (ANAC 14 and 15)**
  - Hold nighttime departure design for ANAC 14 and 15 from further consideration until ANAC 17 and 21 are addressed
- **Jet Departures to the East (6:30 a.m. to 10:00 p.m.) (ANAC 15)**
  - Proceed forward for further consideration
- **Noise Dot Location (ANAC 20)**
  - Proceed forward with Noise Dot #4 and #5 relocation for further consideration

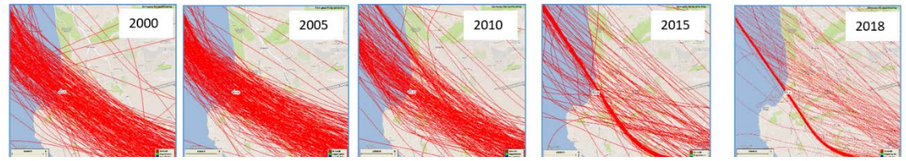
B.2 CAC AND TAC INPUT AND CONSULTANT TEAM RESPONSES

The Ricondo Team (the Team) considered input provided by CAC and TAC at the meetings and in writing. CAC and TAC written comments on materials presented at Meeting #2 (TAC: May 31, 2018; CAC: July 19, 2018), Meeting#3 (TAC: August 30, 2018; CAC: August 30, 2018), and Meeting #5 (TAC: March 28, 2019; CAC: March 28, 2019), and responses drafted by the Team are provided below in this Appendix.

B.2.1 CITIZEN ADVISORY COMMITTEE (CAC) MEETING #2 (JULY 19, 2018) INPUT AND CONSULTANT TEAM RESPONSES

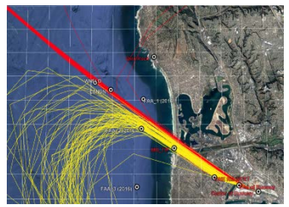
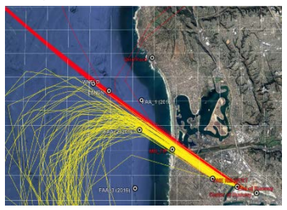
DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
7/20/18	Chris McCann	La Jolla Shores	Rec. 15 - Alternative 1	C-1	The issue of the maximum speed on the SID of 230 knots versus a more typical climb speed of 250 and the impact on climb rate did not appear to be based on any particular aircraft performance capability. Rather, the thinking seemed to simply be, if the aircraft is flying at a slower speed, resulting in a higher deck angle ("our nose would be higher") then it must be climbing faster, assuming the same thrust/weight/etc. In the case of the 737 at least (which represents a very large proportion of flights originating from SAN) a speed of 230 knots on the ZZOOO actually causes the aircraft to climb at a slower rate then a higher airspeed. I suspect this is true for most of the modern jets operating out of SAN.	The current speed restriction of 230 knots is set up to the JETTI waypoint. At the July Technical Advisory Committee (TAC) meeting, a TAC member (Alaska Airlines) stated that as aircraft speed up, the angle of climb is reduced based on the combination of aircraft performance and airline procedures, which impact climb performance. The TAC member expressed concerns related to achieving the expected altitude at the ZZOOO waypoint and inquired why 8,000 feet was recommended by the Airport Noise Advisory Committee (ANAC). The current speed restriction at the JETTI waypoint was set so aircraft can make the turn to ZZOOO waypoint. There is no speed restriction after JETTI. Therefore, increasing speed to JETTI is not feasible if the current ZZOOO Standard Instrument Departure (SID) design is maintained between JETTI and ZZOOO waypoint.
7/21/18	Mike Tarlton	Ocean Beach	Rec. 14 - ELSO	C-2	Very concerned about the committee recommendations having to do with Equivalent Lateral Separation Operations (ELSO). There were multiple variants of ELSO discussed with various recommendations sited as “feasible”. Disagree that any are feasible given the premise that you should not dump noise from one community onto another. Moving the northern flight track from its current 290 heading to the “recommended” 285 heading will move noise both within the 65 CNEL and outside the 65 CNEL contour and it would be at the expense of OB residents to appease South Mission Beach Residents. The 285 heading would basically take noise that now goes over mostly commercial building in the Sports Arena Area and hits the very tip of South Mission Beach and dump that noise back on OB / Loma Portal / Point Loma Heights / Dog Beach Residents. This does not seem right and violates the “do not move noise” from one community (South Mission Beach in this case) to another community (OB / Point Loma) in this case. There is a reason the night procedures are all on the 290 heading. That is because there are fewer homes directly in the 65 CNEL contour on the 290 heading. Moving the 290 heading in the daytime to 285 will dump noise back onto residents that already are sandwiched between the 275 and 290 departure routes currently. Opposed to all the ELSO related recommendation in ANAC Noise Recommendation #14 that move WNFLD waypoint south and/or change the current northern departure heading from 290 to something closer to 275. Changing that heading to 285 is just dumping noise from South Mission Beach onto Dog Beach and does not seem fair.	The concepts apply the 10-degree divergent heading criteria described in Federal Aviation Administration (FAA) Order 7110.65X, *Air Traffic Control*, Paragraph 5-8-1(a). Aircraft are considered "safely separated" from ZZOOO Area Navigation (RNAV) SID departures if the aircraft continue to diverge at 10 degrees. An aircraft on a 275 heading and another on a 285 heading must both be assigned an RNAV departure that does not involve headings or vectors issued by air traffic control (ATC) when cleared to takeoff. While the consultant determined both a daytime and nighttime 10-degree divergent heading from Runway 27 are feasible from an operational standpoint, conflicting comments from various CAC members indicate the need for further review: members from the Mission Beach, Pacific Beach, and La Jolla communities support the feasibility of Equivalent Lateral Spacing Operations (ELSO), while members from Ocean Beach and Point Loma oppose ELSO because it would move flight tracks closer to, and over, their communities. In order to determine potential noise impacts, two ELSO procedures (one daytime and one nighttime) will be designed to qualitatively evaluate the noise effects of these options.
7/25/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 14 - ELSO	C-3	Strongly support further diligence on the ELSO 10degree separation concept. As currently applied in Atlanta, and as contemplated for San Diego, this appears to have strong merit. As I understand the proposal, the WNFLD waypoint could be moved south of its existing location. ELSO could be used to move departure tracks closer together, increasing the number of departure tracks thereby increasing the opportunity for dispersion. Alternatively ELSO could enable building a unique track over the least noise sensitive areas.	Refer to response to Comment #C-2.
7/25/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 14 - ELSO	C-4	Recognize that an ELSO recommendation might entail a longer FAA review process. However, in my view it is more important to get it right from the perspective of mitigating noise on the community and particularly La Jolla, as opposed to a less optimal procedure that might progress faster in the FAA review process. While no one wants delay, we do want long term optimal relief.	Comment noted.
7/25/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 14 - Daytime	C-5	Propose modifying the PADRZ/CWARD SID by changing the initial departure leg type to VI/CF followed by an RF leg, followed by TF to KERNL, with no additional changes to the rest of the route. This configuration would allow aircraft to depart the runway over the same initial ground track that they fly now, until reaching approximately 2.2 miles from the runway. At that point aircraft would execute a Radius to Fix (RF) turn to the west over the least populated areas, while also minimizing bank angle and reflected noise to the north. At the completion of the turn, aircraft would intercept a Track to Fix (TF) leg that diverges from the ZZOOO SID by 10 degrees using the ELSO rules. This design would reduce aircraft noise affecting La Jolla without negatively impacting ATC operations. We recognize that not all aircraft are currently capable of flying these types of SIDS, but as fleets become more sophisticated these routes can be increased.	For response to ELSO, refer to response to Comment #C-2. The proposed concept designed by La Jolla's consultant assumes ATC can change divergent headings while in flight after the initial departure from a runway. The La Jolla consultant’s design attempts to maintain the initial runway heading currently in use to avoid changing noise exposure in areas exposed to the Community Noise Equivalent Level (CNEL) 65 or higher. The proposed La Jolla concept diverges aircraft at 15 degrees, converges aircraft back towards traffic on a 275 heading, and then diverges aircraft again when reaching a 285 course. FAA Order 7110.65X, *Air Traffic Control*, Paragraph 5-8-1(a) only recognizes divergence from the end of a runway, and it does not indicate that aircraft can diverge, converge, and then diverge again. The consultant team asked the FAA Southern California TRACON (SCT) about the diverge-converge-diverge concept design for an RNAV departure. FAA SCT expressed concerns related to above described portion of the concept and indicated that it most likely would not accept the design due to the convergence element. Second, the consultant team consulted with FAA Flight Standards staff to determine if the divergence criteria in FAA Order 7110.65X is limited to starting at the departure end of a runway. FAA Flight Standards staff confirmed that divergent headings described in Paragraph 5-8-1(a) are limited to the end of a runway, as depicted on Figure 5-8-2 in FAA Order 7110.65X (page 5-8-2. The proposed design also includes a Radial-to-Fix (RF) leg, which creates an arc type of route. This type of design requires more accurate navigation performance or Required Navigation Performance (RNP), which, in turn, requires additional equipment in the aircraft and additional training for pilots to be authorized to fly the procedure. As indicated by La Jolla’s consultant, approximately 50 percent of all operators have the equipment and authorized pilots to fly the procedure. Therefore, another SID would still be required to accommodate those operators that are not equipped or authorized to operate an RNP procedure. Establishing two different departure procedures heading in the same direction

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
						(continued) add complexity to ATC operations and traffic management. For example, two flights on the same SID may conduct visual separations because both are on the same predictable route. If the aircraft are on different routes, the trailing aircraft may not be able to maintain visual separation from the lead aircraft. In this situation, FAA ATC would need to provide directions to maintain safe separation. This can affect the efficient movement of aircraft, and, therefore, would not likely be deemed feasible during the first two steps of FAA's PBN Implementation process. The existence of two procedures headed in the same direction can cause confusion with both controllers and pilots. FAA may consider introducing potential for confusion as introducing a new safety risk. Introduction of a new safety risk would not be considered feasible.
7/25/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 14 - Nighttime Alternative 1	C-6	Turn at 1.5 NM, to keep nighttime departures further south of La Jolla. Consider revising the PADRZ SID by moving both the WNFLD and KERNL waypoints 1.5NM south of their present locations. This will ensure aircraft proceed more directly off the coast without paralleling the shore and adds minimal distance to PADRZ. Use "fly by" rather than "fly over" waypoints, to keep traffic further away from the La Jolla shore.	Based on the intent of Recommendation 14, the consultant team's recommendation is to proceed with a nighttime departure procedure design that uses a fly-by waypoint (aircraft near the waypoint, but not over it), under which aircraft follow a westerly heading to remain farther south of La Jolla compared to the existing PADRZ SID. A fly-over waypoint (aircraft fly over the waypoint) would cause a more unpredictable turning path north of the waypoint and would place traffic closer to La Jolla shoreline compared to a fly-by waypoint design. Aircraft will turn inside of the fly-by waypoint, which maximizes the ability to stay as far south as possible from La Jolla. Other CAC members requested a fly-over waypoint to ensure aircraft comply with the Noise Dot Agreement. The draft fly-by procedure design would also keep aircraft from turning until they are 1.5 nautical miles (NM) from the shoreline by estimating where aircraft would likely begin the turn towards the west. The procedure design would involve a new waypoint to guide traffic in a westerly direction; therefore, moving WNFLD and KERNL waypoints is not necessary.
7/25/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 16 - New Concept	C-7	Discussed the COMIX TWO (RNAV) Arrival way points, and my question and suggestion that flights be routed from COMIX directly to KLOMN, rather than through or via LNTRN. This would appear to cover less distance, be more fuel efficient and route arrivals over more unincorporated and undeveloped land, further away from La Jolla. I believe that route would be closer to the Miramar landfill and the I805/SR52 intersection without infringing on Miramar Air Station's airspace. Fellow CAC member Alan Harris discussed that flight arrival data from pre-2013 shows flights on this sort of path, substantially further north from La Jolla. The fact that this arrival path was used in the past suggests its viability. Please consider whether this alternative is feasible	Directing arrival traffic from the COMIX waypoint to KLOMN waypoint would shift traffic crossing the shoreline over the southern portion of the Torrey Pines Golf Course (Alternative 1 design) to over Del Mar residents. Moving arrival traffic closer to Torrey Pines Golf Course would likely be preferred over establishing a new route over a residential area. Additionally, TAC airline members expressed concerns about procedures, such as the COMIX STAR, that require aircraft to descend and to reduce speed at the same time. The TAC airline members are concerned that Recommendation 16, Alternative 1 would require additional measures during descent while reducing speed (e.g., use of speed brakes) in order to comply with the procedure. This procedure will especially challenge newer generation aircraft with modern wing lift capabilities. The shorter distance of the proposed concept from the COMIX waypoint compared to Recommendation 16, Alternative 1 would most likely exacerbate concerns related to descending and speed reduction, and therefore, would not likely be feasible. Historically, the FAA has changed procedures in this area over the years as RNAV technology became more prevalent. The first RNAV for arrivals from the northwest was the BAYVU STAR, which was amended five times after initial implementation. Prior to the BAYVU STAR, a conventional STAR based on ground-based navigation and radar vectors was in place. If the procedure defined as Recommendation 16, Alternative 1 is deemed feasible, the FAA will compare future operations under it to a "No Action" condition in the same year, as required under the National Environmental Policy Act (NEPA) by following FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, to determine if the proposed procedure would be expected to cause significant environmental impacts and reportable changes. The consultant team expects to conduct the comparison using FAA's Aviation Environmental Design Tool (AEDT) model if a design concept is deemed feasible based on design parameters. The No Action condition would be defined by conditions that would be in place if the proposed change is not implemented. Therefore, when comparing the proposed procedure to the No Action condition, the No Action condition would be represented by existing traffic patterns rather than a range of historical traffic patterns/procedures. Because the justification for the proposed procedure would be to reduce community noise exposure, it is unlikely that FAA would approve a procedure that shifts noise exposure from one community to another based on the comparison between No Action (existing traffic patterns) and the Proposed Action (proposed procedure change).
7/25/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 16 - LNTRN Altitude	C-8	If the COMIX to KLOMN flight path described above is not feasible, consider changing LNTRN to at or above 9,000' to better reflect the old BAYVU STAR profile over La Jolla.	Completed. The FAA modified the crossing altitude at the LNTRN waypoint from at or above 8,000 feet mean sea level (MSL) to at or above 9,000 feet MSL. This change is reflected in the COMIX 2 STAR procedure published May 28, 2018.
7/25/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 16 - Alternative 3	C-9	As discussed during the July 19 meeting, La Jolla advocates for rejecting ANAC Noise Recommendation 16 Alternative 3 as a non-starter for La Jolla. The path would bring flights closer to La Jolla and increase the noise impact over La Jolla Shores and the Muirlands.	Recommendation 16, Alternatives 2 and 3 concepts have been removed from further evaluation.

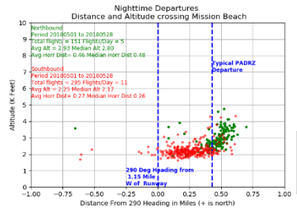
DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
7/25/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 16 - Alternative 1	C-10	There is general public consensus that the "no shifting noise" policy is being unfairly applied in San Diego. Measuring flight noise as of the current date, rather than considering the conditions existing prior to implementation of NextGen Metroplex, misses the mark. The FAA changed flight paths by implementing Next Gen but did not reject those changes because they moved noise onto previously unaffected communities, like La Jolla. It is now paradoxical to refuse to make remedial changes because they would shift noise back to the areas previously impacted prior to the NextGen Metroplex implementation.	Under the SoCal Metroplex, the COMIX STAR flight track was shifted 1,200 feet south over the La Jolla area but the altitude as aircraft crossed the shoreline was increased. In a study conducted by BridgeNet International, (https://bit.ly/2DhDD6j starting on Page 22) it was determined that the "…changes were not in themselves sufficient to result in measurable changes in noise." Furthermore, analysis of 18 years of historic data (the SDCRAA's Airport Noise and Operations Monitoring System [ANOMS]) shows that, historically, aircraft were dispersed over the La Jolla neighborhoods. When the FAA implemented the first RNAV (satellite-based) procedure (BAYVU 1), the flight corridor became increasingly concentrated. The images below show 2 days of San Diego International Airport (SDIA) arrivals by year. Refer to response for Comment #C-7 regarding noise comparison analysis to determine potential impact.  Source: Radar tracks based on the San Diego County Regional Airport Authority's Airport Noise and Operations Monitoring System (ANOMS), accessed September 2018.
7/25/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 15 - Alternative 1	C-11	Modify the ZZOOO SID by moving the JETTI waypoint two miles, or at a minimum one mile, further offshore. Use "fly by" rather than "fly over" way points. This should reduce the noise impact to the La Jolla shoreline without overly burdening the ATC system.	The current design concept for Recommendation 15, Alternative 1 moves the JETTI waypoint 2 NM west of its current location and maintains the fly-over waypoint designation.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 14 - Initial Heading	C-12	All right turn SID's (PEBLE 6, CWARD and PADRZ 2) should be slightly modified to restrict WNFLD, LANDN and RADAR headings no greater than 290 degrees from end of runway (rather than 287 to Noise Dot #2) to reflect 15 degree divergence (275 to 290); 275 (now JETTI) to 290 was the original commitment by FAA in 1998	Evaluating the initial right turn heading for Runway 27 departures should be evaluated (among other proposed initial headings, such as a 10-degree divergent heading) as part of the Title 14 CFR Part 150 Study update process (Part 150 Study update process) to assess the full potential effects on areas exposed to CNEL 65 or higher. Therefore, proposals to change the initial right-turn heading would be evaluated to cumulatively assess potential changes to the CNEL 65 and higher exposure area rather than rejecting these proposals outright.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 14 - Initial Heading	C-13	Takeoff minimums should also be modified to preclude headings right of 290 degrees or left of 275 as is currently occurring after attaining 500-520' causing significant impacts to South Mission Beach, and Fleetridge (Point Loma) as our tracking data indicates; "275 to 520 feet" is not working to restrict tracks as low as 265 and as high as 295 to 305 degrees ("S" curve); consider alternative Flyover waypoint at 1+ miles at 275 from end of runway, equivalent to the average 520' altitude location, replacing 520' altitude requirement	Refer to response to Comment #C-12. Take off minimums have the potential to change the CNEL 65 and higher exposure area and, thus, should be studied in the Part 150 Study update process.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 14 - Fly Over Waypoint	C-14	WNFLD\LANDN should be moved to this 290 heading (satisfying 15-degree divergence) and become a "Fly Over" waypoint; JETTI has successfully managed left turns as a "Fly Over" so right turns should have the same restrictions	Refer to response to Comment #C-12. Moving the WNFLD and LANDN waypoints may change the overflight location along the initial heading, which has the potential to change the CNEL 65 and higher exposure area. Therefore, this proposal should be studied in the Part 150 Study update process.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 20 - Incorporate Red Dot Waypoint Locations into current and future SIDs	C-15	Red Noise Dots should be relocated to the JETTI and WNFLD Fly Over waypoints; Variances from these "fly Over" requirements are what we need to monitor and enforce; cushioned locations offering a wider gate 265 to 295 degrees only distort the facts	Incorporating preferred waypoint locations into final design concepts for Recommendations 14 and 15 is recommended. The only fly-over waypoint carried forward is in Recommendation 15, Alternative 1, which maintains JETTI as a fly-over waypoint. The consultant team recommends for Recommendations 14 and 15 nighttime operations that include a right turn from Runway 27 based on existing PADRZ SID design, and a fly-by waypoint where aircraft change heading to a westerly direction to remain south of La Jolla. Refer to response to Comment #C-6 for a discussion of the benefit of fly-by waypoints. Recommendation 14, Night Alternative 1 would involve a new waypoint (depicted as BROCK-2) where traffic will head towards in a more westerly direction before heading northwest, therefore, rendering the use of WNFLD and KERNL waypoints not applicable. For eastbound departures that turn left, the design will route aircraft traffic west and south of Point Loma. This procedure will reduce the vectoring that currently occurs after 10:00 pm. In addition, other members of CAC proposed a design that would turn traffic towards the west prior to 1.5 NM from the shoreline. The consultant team plans to design a concept that turns departures west as soon as possible without changing initial headings of overflight patterns within the CNEL 65 and higher exposure area.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 14 - Daytime Issues	C-16	"BORDER 7 could be modified slightly: adjust slightly at PGY 19 (left turn to 123 degrees) to accommodate 3 NM separation from PEBLE, but only if still an issue after WNFLD moved to 290	Moving the BORDER SID south is not feasible because it would not address the 3-NM separation requirement between the PADRZ SID and the ZZOOO SID. If the BORDER SID was moved south, traffic on the PADRZ SID would still need to maintain a 3-NM separation from traffic over the JETTI waypoint. If the JETTI waypoint is moved farther west (per

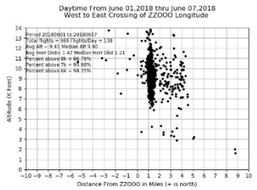
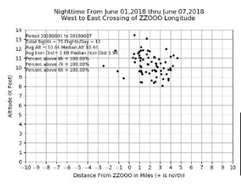
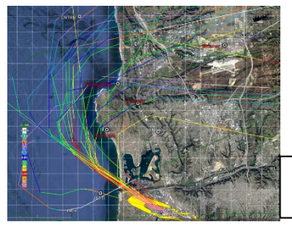
DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
					(continued) degrees; insert ZZOOO prior to POGGI to honor distance from Point Loma; very modest adjustment in actual track as current tracks cut the corner shy of 080 to POGGI	**(continued)** Recommendation 15, Alternative 1), the 3-mile separation from PADRZ SID would be still be required. In addition, it is anticipated that the FAA would require that the ZZOOO SID be similar to the proposed change to the BORDER SID to provide a consistent path between the two procedures in order to (1) reduce the complexity of managing traffic and (2) maintain the ability for visual separation between aircraft on a procedure.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 15 - Alternative 1	C-17	Eastbound tracks (left turns) need to be: a) pushed west of coast per Alt 1, b) pushed higher at ZZOOO and c) restrained from being vectored north of ZZOOO by ATC	Recommendation 15, Alternative 1 extends traffic farther west along the 275 heading prior to turning south and extends the route distance so aircraft can reach higher altitudes near the ZZOOO waypoint. A published procedure does not prevent an air traffic controller from managing traffic (i.e., by vectoring) to maintain a safe and efficient operation. Some CAC members indicated concerns that increasing distance along the route would give reason for an air traffic controller to vector traffic off the ZZOOO SID more frequently. While the consultant team cannot anticipate the frequency of vectoring by an air traffic controller based on track distance or other conditions, this vectoring concern has been shared with FAA SoCal TRACON staff.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 15 - Alternative 1	C-18	JETTI extension from 1 to 2 miles offshore, while maintaining 230 kts speed restriction to increase altitude (for most aircraft) at ZZOOO is preferable, as long as it does not encourage ATC vectoring that eliminates ZZOOO, causing increased tracks between Red Noise Dots #4 and #5 and ZZOOO	Refer to response to Comment #C-1.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 14 - Nighttime Alternative - Initial Heading	C-19	Takeoff minimums should also be modified to preclude headings right of 290 degrees as is currently occurring after attaining 500-520' causing significant impacts to South Mission Beach, as our tracking data indicates; "275 to 520 feet" is not working to restrict tracks as high as 295 to 305 degrees	Refer to response to Comment #C-13.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 14 - Nighttime Alternative	C-20	WNFLD\LANDN should be moved to this 290 heading (satisfying 15-degree divergence) and become a "Fly Over" waypoint; JETTI has successfully managed left turns as a "Fly Over" so right turns should have the same restrictions	Refer to response to Comment #C-12 regarding feasibility of the initial heading from Runway 27. Recommendation 14 Alternatives for nighttime operations do not rely on LANDN and WNFLD waypoints. A new proposed waypoint south of LANDN and WNFLD would be used to direct aircraft in a westerly direction to stay south of La Jolla after passing the first fly-by waypoint (1.5 NM from the shoreline or a point between the shoreline and 1.5 NM out). Designating this turning point as fly-by best meets the intent of Recommendation 14. The design maintains the existing initial heading design in order to maintain existing overflight traffic patterns over areas exposed to CNEL 65 and higher. If a recommended initial right turn heading is proposed during the Part 150 Study update process, the final design may be modified to accommodate the heading.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 14 - Alternative 1	C-21	Alternative 1 Nighttime with "Fly Over" at LANDN (or close thereto at 290 degrees), when moved to 290 degrees is most consistent with Agreement and is consistent with Recommendation 15 Alternative 3	Assuming the commenter is referencing the 1.5-NM turn in the Noise Dot Agreement, a fly-by waypoint design can also meet the intent of the Noise Dot Agreement as long as aircraft do not turn until 1.5 NM from the shoreline. The concept with a fly-by waypoint is equally predictable to meet the intent of the Agreement and best meets the intent of Recommendation 14. Refer to response to Comment #C-12 for discussion of the initial right-turn heading.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 14 - Alternatives 2 and 3	C-22	Concern over noise blast to Mission Beach\Bird Rock at left turn at LANDN	Recommendation 14, Night Alternatives 2 and 3 will not be carried forward due to potential changes in departure flight patterns from Runway 27. The designs are expected to produce less predictable paths and cause aircraft to fly over areas not currently exposed to nighttime overflights. The consultant team reviewed a design that would turn aircraft in a more westerly direction between the shoreline and 1.5 NM west of the shoreline without changing initial heading from the runway, because changes to the initial heading may affect residents in areas exposed to CNEL 65 or higher. If a right-turn heading is proposed as part of the Part 150 Study update process, it can be incorporated into the concept as well as the Recommendation 14 Night Alternative 1 concept.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 14 - Alternatives 2 and 3	C-23	Delete Alternative 2 and 3	Refer to response to Comment #C-22.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec.15 - Night Alternative 3 - Initial Heading	C-24	Move LANDN and WNFLD to 290 degrees (currently 293 degrees)	Refer to response to Comment #C-20.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 15 - Night Alternative 3 - Initial Heading	C-25	Takeoff minimums should also be modified to preclude headings right of 290 degrees as is currently occurring after attaining 500-520' causing significant impacts to South Mission Beach, as our tracking data indicates; "275 to 520 feet" is not working to restrict tracks as high as 295 to 305 degrees	Refer to response to Comment #C-13.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 15 - Night Alternative 3 - Initial Heading	C-26	WNFLD\LANDN should be moved to this 290 heading (satisfying 15-degree divergence) and become a "Fly Over" waypoint; JETTI has successfully managed left turns as a "Fly Over" so right turns should have the same restrictions	Refer to response to Comment #C-20 for movement of WNFLD/LANDN waypoints. An aircraft heading to ZZOOO and an aircraft heading to the northwest share the same initial route from Runway 27, so the point where they diverge should be the same waypoint and type (i.e., fly-by or fly-over). This design provides for safe separation between aircraft. A fly-over waypoint for Recommendation 15 Night Alternative 3 and a fly-by waypoint for Recommendation 14 Night Alternative 1 would introduce a new safety risk by potentially losing safe separation between aircraft (3 NM or more) as the lead aircraft turns left to the south after flying over the waypoint, and the aircraft following initiates a fly-by inside turn to the left to the west at the same waypoint. The FAA cannot consider a procedure feasible if it introduces a new safety risk in the ATC system. A fly-by waypoint best meets the intent of Recommendation 14, and it is not expected to cause aircraft currently vectored west and south of Point Loma to be lower than what occurs today. The design for Recommendation

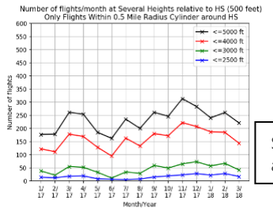
DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
						(continued)15 Night Alternative 2 with a fly-by waypoint will also keep aircraft farther west of Point Loma and direct aircraft to the ZZOOO waypoint, which is expected to reduce headings issued by ATC that keep aircraft south of the Noise Dots but still over the southern tip of Point Loma.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 15 - Night Alternative 3	C-27	Maintain 230 kt speed, Fly Over and Fly By restrictions	Aircraft heading in a northwesterly direction from Runway 27 do not currently have an airspeed restriction. The 230-knot speed restriction at JETTI for the ZZOOO SID is required to make the turn as it was designed. The proposed design for Recommendation 15 Alternative 3 does not require an airspeed restriction because the procedures directs aircraft to join tracks between waypoints. This design widens the turn compared to the existing ZZOOO SID procedure. The wider and more predictable path is expected to keep aircraft farther west of Point Loma, and to increase the frequency of flying at or above 8,000 feet MSL near the ZZOOO waypoint.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 15 -Night Alternative 3	C-28	Fly By at WP2 and higher altitude at ZZOOO is benefit to Point Loma and to Coronado	Comment noted.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 15 - Night Alternative 2	C-29	Delete Recommendation 15 Nighttime Alternative 2	Refer to response to Comment #C-26. Recommendation 15, Night Alternative 2 provides a better balance in meeting the intent of Recommendations 14 and 15 compared to Recommendation 15 Night Alternative 3, and it would not potentially introduce new safety risks or inefficiencies in the ATC system.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 15 - Night Alternative 3 - Initial Heading	C-30	Nighttime traffic does not require divergence as all departures should be at 290, consistent with Agreement; this is by default a traffic constraint that honors the Agreement and needs to be maintained in the future	The commenter is correct. Aircraft are directed via a procedure or by headings issued by ATC along a similar path at night. Divergence is not applicable for nighttime departures from Runway 27, because a single heading is issued by ATC for all departures on Runway 27.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec.16 - Alternative 1	C-31	Historical alignment of approach was much further north, crossing the coast at south Del Mar (at the slough), close to Miramar and over the landfill. This is the least populated route.	Refer to response to Comment #C-10.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 16 - Alternative 1	C-32	"COMIX to KLOMN; Establish two recommendations; (1) pre Class B correction = now, and (2) post Class B correction = future; both to include: a. Move COMIX back to BAYVU location, 1.06 NM northeast b. Remove\minimize dog leg; move LNTRN, XMANS north c. Move KLOMN north and east (pre and further north post Class B correction) d. Adjust XMANS to altitude consistent with descent gradient, without dog leg e. Maintain altitude as long as possible; descent gradient (375'/mile) to reach KLOMN at 6,000, allows LNTRN at or above 11,000 MSL (LNTRN to KLOMAN = 15 NM or 4,950 altitude change; 6,000 + 4950 = 10,950 or 11,000 (without cushion)) f. Shifts noise BACK to original and much less populated area"	Refer to response to Comment #C-7 regarding the COMIX to KLOMN recommendation. As discussed at the kick-off meeting, this study effort will assess the feasibility of procedure designs within current procedure design criteria and ATC boundaries, which includes the Class B airspace. FAA is conducting a Class B redesign effort but provided no clear indication when and if the proposed redesign will be implemented. The proposed redesign does not change the operation of aircraft in the area in which aircraft descend between LNTRN and KLOMN. East of KLOMN, the redesign proposal adds a shelf that extends down to 4,000 feet MSL instead of the current 4,800-foot floor, which could keep aircraft descending along the downwind path within Class B airspace. a.) Relocating COMIX to another location can have a detrimental effect on maintaining an optimized descent from the enroute portion to COMIX and deconflict with other traffic in the airspace, which was a critical consideration in the design of COMIX. This occurs in the area where the Los Angeles Air Route Traffic Control Center (LA ARTCC) transfers control over to SCT. The consultant team recommends maintaining the current location of the COMIX waypoint to minimize potential feasibility concerns from FAA LA ARTCC and SCT. b.) Recommendation 16, Alternative 1 increases the attitude at LNTRN up to 10,000 feet MSL (consistent with the ANAC recommendation), removes the dog leg so traffic heads direct to the KLOMN waypoint, and adds a new waypoint over the I805/SR52 intersection with an altitude that is consistent with required descent gradients. c.) KLOMN serves as the initial approach fix to the RNP Runway 27 approach. Any change to KLOMN will require a change to the RNP Runway 27 approach location. Moving KLOMN farther east and/or north could require moving the base turn for the RNP approach farther east due to required optimal descent-rate and leg-length requirements prior to starting a turn to the south towards the final approach. Moving KLOMN farther east would also introduce potential terrain issues and conflict with arrivals from the northeast. Moving KLOMN would also change traffic routes along the downwind as traffic descends, which could cause additional noise concerns. Finally, moving KLOMN east and/or north also may result in potential conflicts with other airport traffic in this area as traffic descends to the Airport. d.) Assuming the commenter is referring to the proposed waypoint at the I805/SR52 intersection as "XMANS," the consultant team included an altitude in the procedures that is consistent with descent gradient requirements. e.) Refer to response to comment #C-10.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Recommendation 16 - Alternatives 2 and 3	C-33	Delete Alternatives 2 and 3	Refer to response to Comment #C-9.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	ELSO	C-34	Recommend that all above alternatives are pursued and implemented at the 15 degree\ 275-290 separation	Refer to response to Comment #C-12.
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	ELSO	C-35	Pursue ELSO noise analysis to evaluate potential positive impacts vs. 15-degree standard	Refer to response to Comment #C-2.

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
7/27/18	Casey Schnoor	Sunset Cliffs/Fleetridge	ELSO	C-36	Pursue the lengthy process of evaluating ELSO at 10-12 degrees, given potential NEPA requirements, timeframe to pursue with FAA, risks of restriction due to redistribution of noise from 293 degrees to 285, etc.	Refer to response to Comment #C-2.
7/29/18	Leonard Gross	Birdrock/ La Jolla	General	C-37	It appears you are constraining the solution space to have no changes in initial heading, no changes within 65 DL, and no moving of any traffic from one area to another, and no impact on KSAN capacity. However, the FAA considers a change of up to 1.5 dBA within 65 DNL boundary as insignificant, so small changes should be "allowed." Also note, that to get a 1.5 dBA change you would have to increase the air traffic in an area by about + 40%. Within areas outside 65 DNL the "no impact: level is 3 dBA (60 to 65) or 5 dBA (46 to 60). Perhaps you have taken the "minimum change approach" as an initial cut or to minimize potential problems in getting them approved? Or you are just "flagging" some of them as Part 150 issues, but the impression given is that they are "show stoppers" for some of the options. I think this was clarified a bit at the July 18 meeting. Indeed, it was more indicating potential problems and not necessarily a show stopper.	Refer to response to Comment #C-2. The commenter is correct about FAA's NEPA thresholds related to significant and reportable changes, but Title 14 CFR Part 150 also recognizes people who are newly exposed to CNEL 65 or higher no matter what the level of change is between a baseline and alternative. Evaluating potential effects with areas exposed to CNEL 65 or higher requires development of a cumulative noise exposure analysis that is reviewed and accepted by FAA. This and the sensitivity related to high levels of noise exposure for residents near SDIA is why changes to initial heading are best assessed through the Part 150 Study update process. If a preferred initial heading alternative is identified as a result of the process, the procedure designs can be adjusted as needed to accommodate it.
7/29/18	Leonard Gross	Birdrock/La Jolla	Rec. 14 - Daytime Issues	C-38	On Slide 13 you say that the moving the WNFLD and LNDN waypoints would violate the 15-degree separation and then impose the 3 NM "rule." This leads us to look at the 10-degree separation path. However, currently during nighttime flight we see aircraft paths that are only a few degrees apart for several miles. (see section 1.3 below). As shown in your slide 13, the westerly going portion of the BROCK-like path is parallel to the south going flights (i.e. NOT converging with them). The path shown on this chart is clearly no worse, and actually looks safer than takeoffs from parallel runways which are allowed. Please explain.  Source: Graphic provided by and referenced by commenter.	As discussed at CAC Meeting #2, aircraft operate along the same heading from Runway 27 after 10:00 p.m. In this situation, ATC waits to release the next departure until 3-NM separation can be achieved by the time the following aircraft is airborne. The divergence is not applied because aircraft are following behind along a single heading. There is variation in the track location due to multiple variables such as wind, aircraft performance, and the type of procedure (i.e., radar vectors or RNAV SID), but the aircraft are following a similar path (less than 15-degree divergence) and are separated laterally. The graphic provided by commenter depicts traffic heading south then east in yellow, and traffic heading northwest in red. The traffic shown in yellow at night is issued a 290 heading by the San Diego International Airport (SAN) Air Traffic Control Tower (ATCT) because there is no published SID for south/east traffic with a 290 heading. The traffic flows shown in red are issued the PADRZ SID and follow the RNAV procedures from the runway. There is some variance between the two flows, but the flows do not diverge more than 15 degrees; therefore, they are treated as though they are on the same heading and are laterally separated. Regarding the parallel portion of the route that goes to the west depicted on the Recommendation 14 Daytime Issues slide, the route indicates how soon aircraft can change course once the 3-NM separation is established.
7/29/18	Leonard Gross	Birdrock/La Jolla	Rec. 14 - Daytime Issues	C-39	The 10-degree divergence path option is a very important for LJ and MB as it addresses the daytime noise. The text gives a general idea of the challenges to get it implemented and clearly there are hurdles. What can be done now to get a better idea of it the likelihood that it would actually be implemented?	Refer to response to Comment #C-2.
7/29/18	Leonard Gross	Birdrock/La Jolla	Rec. 14 - Daytime Issues	C-40	Another way to look at the night traffic is with the actual tracks. It is very interesting that the nighttime departures have two paths that travel nearly parallel for several mile, and when they diverge they are not 3 NM separated. Why is this allowed and can it be exploited in SAN for daytime operations (i.e. see slide 13)  Source: Graphic provided by and referenced by commenter.	Refer to response to Comment #C-38. Use of a single heading occurs only during nighttime hours through 6:00 a.m. Use of a single heading for departures would not work during the daytime hours because high-demand periods would limit capacity into and out of SDIA.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - Daytime Issues	C-41	Typo for Border 3 Departures, this probably should be Border 7	The commenter is correct, the slide should read "BORDER 7." All future graphics will be changed.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - Nighttime	C-42	Analysis of nighttime traffic has repeatedly shown that aircraft going south follow a different heading from those going north. Aircraft going north seem to be on a PADRZ heading while aircraft going south are a few degrees south of that. We do NOT WANT PADRZ to be defined as the nighttime departure procedure for all aircraft, as it would bring significantly more noise to MB, PB, and the southern coastal part of a La Jolla.	Refer to response to Comment #C-38 related to the dispersion depicted on the provided graphic. Normally, FAA prefers initial heading designs for RNAV procedures to be identical to those that share the same or a common path. This provides a more predictable path for aircraft. Further discussion with FAA will be required to determine if an identical design is a requirement. Currently, Mission Beach residents are seeking adjustments to the PADRZ initial route so that traffic is located similar to where traffic following a 290 heading operate (yellow in the graphic with Comment #C-38). Ocean Beach residents are concerned about moving traffic farther south. The proposed alternative identified by the commenter, among others including Mission Beach and Ocean Beach residents, and the potential effects the alternative may have on the area

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
						(continued) exposed to CNEL 65 and higher must be considered. Potential effects on the area exposed to CNEL 65 and higher would be assessed as part of the Part 150 Study update process.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - Nighttime	C-43	The chart brings to mind one more alternative, turn at earliest point that does not impact 65 DNL boundary	Recommendation 14 Night Alternatives 2 and 3 were designs intended to turn aircraft in a westerly direction as soon as aircraft are beyond the area exposed CNEL 65 and higher. In both cases, the TARGETS flyability simulations indicated that more unpredictable paths from the runway could occur over the area exposed to CNEL 65 or higher. The designs will most likely increase dispersion over areas not frequently overflow by Runway 27 right-turn departures. The two turn locations were close to the area exposed to CNEL 65 or higher and to the shoreline. A design that turns aircraft somewhere between the shoreline and 1.5 NM from the shoreline without impacting traffic patterns close to the runway may be feasible. The consultant will look at a design between 1.5 NM and the shoreline that does not change the existing overflight patterns over areas exposed to CNEL 65 or higher.
7/29/20 18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - Nighttime Alternative 1	C-44	This does not take into account that there are two headings being flown at night.	Refer to response to Comment #C-38.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - Nighttime Alternative 1 - Fly Over Waypoint	C-45	"Last bullet in white box: "Not compatible with proposed ANAC Recommendation 15 Nighttime Alternative 1 design concept" Typo? I think this is supposed to say Nighttime Alternative 3 since there is no Nighttime Alternative 1 and slide 26 which is labeled "ANAC Noise recommendation 15 Alt 1 Design" is not a nighttime procedure. (By the way, it is confusing when the first Recommendation 15 night alternative (slide 17) is called alternative 2). How can this or the ANAC 15 be changed so they are "compatible"? "	The typo identified by the commenter will be corrected to read "Recommendation 15, Night Alternative 2." Recommendation 14, Night Alternative 1 - Fly Over includes a fly-over waypoint at the 1.5-NM turning point from shoreline. Recommendation 15, Night Alternative 2, includes a fly-by waypoint. To be compatible, both need to share the same type of waypoint at the 1.5-NM turning point. Because an aircraft heading to ZZOOO and an aircraft heading to the northwest share the same initial route from Runway 27, the point where both diverge should be the same waypoint and type. This design would provide safe separation. A fly-over for Recommendation 14, Night Alternative 1 and a fly-by for Recommendation 15, Night Alternative 2 would introduce a risk of losing safe separation (3 NM or more) when the lead aircraft turns left after flying over the waypoint, and the following aircraft is about to conduct an inside turn at the same waypoint. This would likely introduce a new safety risk to the ATC system that cannot be considered feasible by the FAA.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - Nighttime Alternative 1 - Fly Over Waypoint	C-46	"Increases flight distance by approximately 1.4 NM" These seems high. Previous analysis showed a smaller distance. (Sorry but haven't gone back and checked this.)	The 1.4-NM distance is based on the estimated route, depicted in orange on Slide 15 of the CAC Meeting #2 presentation (July 19, 2018), up to the point where it joins back up with the existing procedure (white line).
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - Nighttime Alternative 1 - Fly By Waypoint	C-47	"Not compatible with proposed ANAC Recommendation 15 Nighttime Alternative 1 design concept" Appears to have same "typo" problem as slide 15	Refer to response to Comment #C-45. A fly-by waypoint best meets the intent of Recommendation 14 and is not expected to cause aircraft currently vectored west and south of Point Loma to be at a lower elevation than what occurs today. The design for Recommendation 15 Night Alternative 2 with a fly-by waypoint will also keep aircraft farther west of Point Loma and direct aircraft to the ZZOOO waypoint, which is expected to reduce headings issued by ATC that keep aircraft south of the Noise Dots but allows aircraft to continue to operate over the southern tip of Point Loma.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - Nighttime Alternative 2	C-48	"Most likely not feasible due to expected change in initial departure heading from Runway 27…" Was this supposed to say "may not be feasible due to it requiring a change in initial departure heading", versus something else that is changing the initial heading from its current direction? Please explain	As discussed at CAC Meeting #2, the location of the fly-by waypoint at the shoreline is expected to cause less predictable paths near the airport as aircraft takeoff and begin the turn towards the waypoint. Based on the TARGETS flyability estimates, the heavy and low performing jet aircraft could end up flying over areas of Ocean Beach that are not currently exposed to overflights and can create wide dispersion instead of a more predictable desired path (e.g., along the 290 heading) prior to reaching the waypoint. The TARGETS flyability simulation indicated that heavy jets may skip the first waypoint and head towards the second one. This does not provide a desired repeatable and predictable path for noise abatement purposes; therefore, the consultant team recommended not to proceed further with this design.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - TAC Input	C-49	Note if WNFLD will be moved South for a 10-degree daytime procedure, we should also move KRNL south to assure the path continues as westward as possible.	If the 10-degree initial heading from Runway 27 is found to be feasible during the Part 150 Study update process, the consultant team will look at the opportunity to move the KERNL waypoint farther south as long as it meets design parameters and does not require relocating the GYWNN waypoint or removing the altitude restriction at GYWNN. As discussed at CAC Meeting #2, if a 10-degree heading is implemented, it would need to be included in other Runway 27 SID procedures like the MMOTO, CWARD, and ECHHO SIDs.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - TAC Input	C-50	"Not consistent with nighttime noise abatement heading." As discussed in section 1, there are at least two headings and none has been formally defined.	The bullet on slide 19 referenced by the commenter was a comment from a TAC community member. The intent of the commenter was to point out that the current initial heading design for PADRZ, which was maintained in the concept designs, does not reflect the historic nighttime noise abatement heading traffic patterns.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - TAC Input	C-51	Options 1,2 and 3 "Do not mitigate nighttime noise for Mission Beach" – Actually, they will if the path flown keeps the aircraft farther south than currently (i.e. those flights heading North)	Refer to response to Comment #C-2. A proposed 10-degree heading would reduce noise levels over Mission Beach but may adversely affect residents in Ocean Beach as indicated by comments provided by Ocean Beach CAC members. San Diego County Regional Airport Authority (SDCRAA) expects discussion and further evaluation of initial right-turn heading proposals would occur as part of the Part 150 Study update process.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Nighttime Noise Abatement Heading	C-52	This mistake in showing nighttime departures as PADRZ, is part and parcel of the fact that the noise abatement "agreement" has no formal documentation and in fact has changed over time. I believe	Noise abatement headings are considered valid noise abatement measures to be evaluated under the Part 150 Study update process. It is expected that they will be considered to address ANAC Recommendations 17 and 21 related to the Nighttime Noise Abatement Procedure.

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
					(continued) other airports have noise abatement procedures (NAP) on their navigation charts, but for some reason we don't. Will this or the Part 150 formalize the nighttime headings?	
7/29/18	Leonard Gross	Birdrock/La Jolla	Nighttime Noise Abatement Heading	C-53	Below is a Scatter-gram ("gate") plot for May 2018 which shows that a 290 and a PADRZ path are actually being flown at nighttime. This is very important since if the current initial headings are not to be changed, then one must understand what those departures really are! Also note that a 290-heading measured from a vertex at 1 NM from the end of the runway, actually puts the aircraft over the channel, and not over Mission Beach. However, we can see that they are actually North of the 290 heading and most travel over MB land. There should be an RNAV departure procedure that creates a "super highway" at the "agreed upon" 290- heading. (Think of that PADRZ red line shown below as moving south so it is centered over the channel.)  Source: Graphic provided by and referenced by commenter.	Refer to response Comment #C-38.
7/29/20 18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - ELSO	C-54	Slide 20: ATL has used this for many years, any idea why the other airports listed have not yet gone operational with it? I think this was addressed at the meeting, but don't recall the answer.	Based on the consultant team's discussion with FAA staff familiar with ELSO, the primary reason that ELSO implementation has been slow is due to the potential effects on residents in areas exposed to day-night average sound levels (DNL) of 65 or higher. Noise analyses showed that Hartsfield-Jackson Atlanta International Airport (ATL) would not encounter this issue. Changing initial departure headings can have a direct effect on the shape of a noise exposure contour at DNL 65 and higher. If significant impacts (i.e., an increase of DNL 1.5 or higher for areas exposed to DNL 65 or higher levels) are possible, FAA would need to consider conducting an Environmental Impact Statement (EIS) and identifying mitigation.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - ELSO	C-55	Slide 20: On the top right figure, what does the 1 Mile arrow mean? Can aircraft have less than separation after 1 NM?	The 1 NM arrow indicates that FAA ATC can release the following departing aircraft once the lead aircraft is 1 NM away. The following aircraft will not be on the same route as the lead aircraft, which turned left and followed the solid line shown on the graphic. The following aircraft would turn right at a 15-degree divergent heading and follow the dashed line on the graphic. If the following aircraft was to follow the path indicated by the solid line, FAA ATC would need to hold the aircraft until the air traffic controller can make sure the aircraft will be 3 NM or greater behind the lead aircraft.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - ELSO	C-56	Slide 21: Typo: "one to two possible initial" should probably be "one of two possible options" What are these two possible optons?	The referenced text on slide 20 was not a typo. One option is to design an initial heading at 285 degrees (10-degree divergence from 275). Another option is to design an initial heading at 290 degrees (15-degree divergent heading from 275). This is what was meant by "one to two possible initial departure headings." It is preferable to have both the south/east and north/northwest traffic operate along the same path using the same type of navigation (e.g., RNAV SID or ATCT-issued headings) to achieve a consistent and predictable path. A design could have a 285 heading or a 290 heading, but it is preferred to decide on one common path for all departures turning right from Runway 27. The common path should be agreeable to residents who reside south and north of the proposed path. This is why the initial heading analysis is expected to be discussed and assessed under the Part 150 Study update process.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 14 - ELSO	C-57	"Slide 21: "Implementation at ATL suggests separation may begin at VA/DF or VA/CF turn point versus separated 10 degrees from runway end – further local FAA coordination will be required as part of the alternate procedure design" Your interpretation would imply that at ATL they have to fly quite a bit from the runway before changing to 10 degrees, so what headings do they fly before getting to the VA/DF or VA/CF? Also, some of the FAA diagrams show the turn very near the end of the runway. My guess is they head to a VA/DF a or VA/CF very close to the end of the runway, otherwise they would be flying parallel to the other runway until they hit the waypoint. That would be less safe than the 15-degree separation.	Aircraft departing from some of the runways at ATL may continue on the runway heading until about 1 NM from the departure end of the runway. In these cases, the RNAV design relies on a Vector-to-Intercept and Course-to-Fix (VI/CF) design. In other cases, aircraft begin the turn from the runway up to 1 NM from the departure end of the runway. This is based on an RNAV design using Vector-to-Altitude and Direct-to-Fix (VA/DF) design.

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
7/29/18	Leonard Gross	Birdrock/La Jolla	Rec. 15 - Daytime Alternative 1	C-58	A quick analysis of current paths around Pt Loma indicates that during the day virtually all (87%) are already achieving this and 96% are above 7K feet, and 100% are achieving it at night. Below, Figure 1.4-1 and Figure 1.4-2 illustrate this. The first shows a week of altitude/position relative to ZZOO during the daytime hours. The second is the same period of time but during nighttime operations, where 100% are above 8 K. Of course, they fly a different path than daytime departures. These charts do a lot to inform the analysis of the request and suggest that more noise reduction might be achieved by simply getting aircraft to fly over ZZOO rather than getting 100% of the flights at 8000'.   Source: Graphics provided by and referenced by commenter.	Comment noted.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 15	C-59	Slide 23, Item 3: This is listed as a Part 150 item, but it seems like the concept has already been rejected since it would change initial headings and potentially modify 65 DNL boundary	The ANAC recommendation to limit aircraft headings between 275 and 290, including headings for propellers, was not rejected. Discussion and assessment of this recommendation is best conducted under the Part 150 Study update process due to potential effects this change may have on the CNEL 65 or higher exposure area. In addition, this recommendation should be assessed as a part of other proposed initial departure heading concepts under the Part 150 Study update process.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 15 - Initial Review	C-60	Slide 25, Item 1: "East bound flights should reach a minimum of 8,000 feet MSL before crossing over ZZOOO: A requirement of 8,000 feet MSL at ZZOOO waypoint is not feasible based on existing design of procedure, but may be possible if existing procedure design is modified (see ANAC 15 Alternative 1)" It See section 1.4, most of the aircraft are making this now; are "tweaks" possible rather than a redesign?	Recommendation 16, Alternative 1 is in essence a "tweak." By moving the JETTI waypoint farther west, it is expected that the aircraft altitudes would be higher compared to what presently occurs. Recommendation 16 also includes moving traffic farther west from the Point Loma shoreline, which Alternative 1 achieves.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 15 - Initial Review	C-61	Slide 25, item 2: "Redirecting flights off of their filed ZZOOO flight plan departure, to turn north then east over La Jolla: If an RNAV SID is implemented for eastbound departures on a directed 290° heading and thence directed towards ZZOOO waypoint, it would decrease frequency of traffic vectored north then east over La Jolla (ANAC 15 Alternatives 2 and 3 addresses this issue)." I don't understand this. These still do occur, see figure 2.11-1 below, but we don't want to establish a procedure that makes this official Is this suggesting having a 290 departure during the day? If so that would impact OB, MB, PB and LJ  Source: Graphics provided by and referenced by commenter. .	The consultant team did not propose a procedure design that would direct eastbound traffic over La Jolla. The intent of the statement on slide 25 was to indicate a benefit to La Jolla if an RNAV SID was designed for nighttime departures heading to the ZZOOO waypoint (Recommendation 15 night alternatives). SCT TRACON indicated that if there is an RNAV SID to ZZOOO that includes the required nighttime heading to the right, the frequency of turning eastbound aircraft to the right to fly over La Jolla would decrease. Aircraft heading east at night are already issued a 290 heading. The proposed concept would provide an RNAV SID to replace radar vectoring towards ZZOOO. The consultant team did not design a concept for ZZOOO departures that includes a right turn from Runway 27 because the FAA can assign the procedure during daytime hours.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 15 - Nighttime Alternative 2	C-62	The beginning of this path is essentially the current nighttime procedure for south going flights. Those flights are already making the 8K altitude limit, so I'm not sure what this is proposing? Given similarly to current path near MB, it would not provide any benefit to that area. Would this help reduce the number of flights that travel too far north before turning to the south?	The intent of Recommendation 15 nighttime alternatives is to keep traffic near the ZZOOO waypoint and south of Point Loma at night. Currently, the nighttime ZZOOO departures are radar-vectored because there is no RNAV SID available during nighttime hours for ZZOOO departures that make a right turn from Runway 27. As a result, some aircraft are vectored over the southern tip of Point Loma south of the Noise Dots.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 15 - Nighttime Alternative 3	C-63	"May not be feasible with proposed ANAC Recommendation 14 nighttime design concepts due to potential of converging traffic with aircraft on proposed northbound SID" What is the benefit of this relative to slide 27. What changes can made in either recommendation to eliminate the conflict?	An aircraft heading to ZZOOO via an RNAV SID and an aircraft heading to the northwest (PADRZ SID) would share the same initial route from Runway 27 at night. The point where traffic diverges should occur at the same waypoint and have the same type of operation (i.e., fly-by or fly-over). This design provides for safe separation between aircraft. A fly-over for Recommendation 15 Night Alternative 3 and a fly-by for Recommendation 14 Night Alternative 1 has the potential to reduce the separation between aircraft below 3 NM and introduce a new safety risk into the ATC system. The separation can be jeopardized when the lead aircraft turns left to the south after flying over the waypoint, and the following aircraft is about to conduct an inside turn to the left towards the west at the same waypoint. Introducing a safety risk that does not exist in the ATC system can be considered not feasible by the FAA. A fly-by waypoint best meets the intent of Recommendation 14, and it is not expected to cause aircraft currently vectored west and south of Point Loma to be at

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
						(continued) lower altitudes than what occurs today. The design for Recommendation 15 Night Alternative 2 with a fly-by waypoint would also keep aircraft farther west of Point Loma and direct aircraft to the ZZOOO waypoint, which is expected to reduce headings issued by ATC that keep aircraft south of the Noise Dots but still operate over the southern tip of Point Loma.
7/29/18	Leonard Gross	Birdrock/ La Jolla	Rec. 15 - TAC Input	C-64	"CAC Alternative 1 – Can this design be considered a nighttime departure path? CAC Alternative 2 - This does not mitigate noise over mission beach" What do CAC alternatives 1 and 2 refer to? Recommendation 15 options 1 and 2?	The TAC member who made the comment was referring to Recommendation 15, Alternative 1, which is intended for aircraft operations during the daytime to follow the 275 heading. The TAC member is inquiring about using the 275 heading at night for eastbound departures to reduce nighttime overflights near the Mission Beach area. The TAC member also indicated that Recommendation 15 nighttime designs continue to route traffic near Mission Beach, so they do not help reduce noise over Mission Beach.
7/29/18	Leonard Gross	Birdrock/ La Jolla	General - Nighttime Noise	C-65	The total number of nighttime departures represent about 20 flights a day versus out of a total of around 300 departures every 24 hours. Though clearly "any improvement is welcome," the nighttime change represents only a small part of the traffic (Yes in DNL/CNEL metrics they get more weight because it is sleep time but the 10 decibel penalty makes this is equivalent to about 200 flights a day out of the 300, but that's only if you accept the relevance of the DNL metric to actual annoyance.) However, it is the "delta" from current nighttime flights to any proposed change that is important. That is, the 10 dBA penalty is already baked into the current 65 DNL boundaries	Comment noted. Not only is the change in CNEL critical, so is newly exposing residents to aircraft noise levels of CNEL 65 or higher as it relates to land use compatibility.
7/29/18	Leonard Gross	Birdrock/La Jolla	COMIX Arrivals Over La Mesa	C-66	I previously had provided [CAC member name redacted] with a chart of aircraft below specific height near Helix High School. Unfortunately, that chart had an error. It has since been corrected and verified by looking at the KSAN's own website. Below is the updated chart. Does this problem merit analysis by the FPA team or is it an ATC issue that needs to be handled separately?  Source: Graphics provided by and referenced by commenter.	There are arrival procedures in place that direct traffic north of the CAC member's residence, but she resides in an area where FAA ATC direct traffic using headings and altitude assignments to merge the arrivals into the final approach stream. This is a very dynamic situation to manage. The Authority plans to hold further discussions with the CAC member and the East County ANAC representative regarding the formation of the East County working group, which is intended to assess SDIA arrivals and possible means to address noise concerns in this area.
7/29/18	Leonard Gross	Birdrock/ La Jolla	General	C-67	The labeling of alternatives is confusing, so much so that two of the slides is incorrectly referenced (see section comments 2.3 below and slide 29). Also, because of the separation by Recommendation number, it is hard to see how the items in Recommendation 14 relate to items in Recommendation 15, and why they are in conflict. It is also hard to tell what changes to current flows are being evaluated without the current procedure (or radar tracks) on the same chart. Currently you have to do a bit of page flipping to look at the "before and after" This is especially true of the Alternatives 16 charts. It clear why you organized the presentation like you did, but if there is a final version for this information, consider a different organization which addresses some of these presentation issues	Comment noted. The consultant will attempt to make future graphics easier to understand, while still providing the necessary technical details.
7/30/18	Dave Kujawa	Ocean Beach	General	C-68	Appreciate if the meetings contained less technical jargon. Many panel members have extensive aviation experience and appreciate their expertise. Some concepts should be explained in plain English at least once. For example, the differences between a fly-by waypoint and fly-over waypoint were not explained. Nor were the pros and cons of the differences between waypoint types explained adequately.	Comment noted. The consultant team will make every effort to simplify the presentation material and will make every attempt to define technical terms when used in presentations.
7/30/18	Dave Kujawa	Ocean Beach	General	C-69	Overall goals of the ANAC recommendations seem tilted to the goal of reducing noise north of Ocean Beach. While flight paths cross directly over Ocean Beach, many areas in Ocean Beach are outside of the 65 CNEL contour and are not covered by the Quieter Home Program. As such, proposals to reduce noise in other areas should not come at the expense of Ocean Beach.	Comment noted. As referenced in several previous responses, any changes that affect the CNEL 65 and higher exposure area, which includes area north of Ocean Beach, must be evaluated during the Part 150 Study update process.
7/30/18	Dave Kujawa	Ocean Beach	Rec. 14 - ELSO	C-70	Agree with the comments by Mr. Mike Tarlton's email *[Comment C-3]* dated July 21, 2018. Narrowing the departure heading window would seem to move noise that now goes over mostly commercial buildings in the Sports Arena Area and hits the very tip of South back on OB / Loma Portal / Point Loma Heights / Dog Beach Residents. Thus, opposed to the ELSO related changes that were proposed.	Refer to response to Comment #C-2.
7/30/18	Dave Kujawa	Ocean Beach	Rec. 15 - Daytime	C-71	To further reduce noise in Ocean Beach, request TAC to consider using a route such as "Night Alternative 2" for daytime departures for large aircraft (e.g., direct flights to Europe and UPS/FEDEX planes). These aircraft are the loudest and the ones that are complained about most by OB residents.	The commenter proposes to distribute operations between two departure procedures to reduce noise. This means operations would be distributed between two different directions to reduce noise over a specific area. During the daytime, aircraft heading north/northwest are assigned the PADRZ RNAV SID or PEBLE Conventional SID, which direct aircraft to the right after takeoff. Aircraft headed to the south or east are assigned the ZZOOO RNAV SID or BORDER Conventional SID, which direct aircraft on runway heading or 275 degrees. This creates a 15-degree divergence, which allows FAA to release

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
						(continued) departures after the lead aircraft is approximately 1 NM away instead of holding to wait for the leading aircraft to be 3 NM away. The nighttime alternative designs are applicable only when FAA issues a single heading or a procedure that directs traffic along a similar heading, which only occurs during nighttime hours. Introducing an aircraft headed south or east on the PADRZ RNAV SID path would require the aircraft to turn south and conflict with other aircraft assigned to the 275-degree path to the south/east. This would introduce a new safety risk in the ATC system and would potentially require following aircraft to hold on the runway until safe separation from the lead aircraft can be provided. Holding aircraft for departure can have a direct impact on the operational efficiency. The proposed measure could also have a direct effect on the CNEL 65 and higher exposure area; therefore, further discussion and assessment should be conducted under the Part 150 Study update process along with other proposed initial departure heading and procedure use measures.
7/31/18	Robin Taylor	Sunset Cliffs/ Ocean Beach	Rec. 14 - Nighttime	C-72	Since the impact to Ocean Beach/Point Loma is limited in each of the alternates all are acceptable. It is understood that any changes will take into account the greater population in the OB corridors as opposed to the South Mission Beach.	Commenter is correct that any evaluation related to changing initial runway departure headings will account for residents in Ocean Beach as well as Mission Beach. The Part 150 Study update process will include a noise exposure assessment for each proposed measure to determine potential benefits and effects. SDCRAA will gather input from TAC and CAC related to each measure. The main intent of a Title 14 CFR Part 150 study is to reduce noise exposure within the CNEL 65 or higher exposure area and to not cause an increase in noise at incompatible areas.
7/31/18	Robin Taylor	Sunset Cliffs/ Ocean Beach	Rec. 15	C-73	All options were acceptable as long as early turns are addressed in a different forum. As noted, even one early turn can cause residential backlash even if the vast number of airlines are tracking properly.	SDCRAA is actively monitoring early turns and reporting back to ANAC regarding number of early turns and probable causes for early turns, which are predominantly at the request of the FAA to maintain traffic separation for safety. Procedure concepts under evaluation maintain initial headings until aircraft pass shoreline. This Flight Procedure Evaluation effort is not assessing missed approaches and piston aircraft headings that differ from 275 or 290 issued headings.
7/31/18	Robin Taylor	Sunset Cliffs/ Ocean Beach	General	C-74	Want to state again that the aircraft speed reduction being carried out by MIT/MassPort be kept on the front burner and that all efforts should be taken to utilize the NASA Aircraft Noise Prediction Program (ANOPP) in future studies. Having worked in the aircraft industry, I know that the jet engine and nacelle technology have probably reached the pinnacle of noise reduction so the only other option for communities under the flight path (OB/South Mission Beach/Point Loma) is the reduction of airframe noise.	The commenter is referencing the National Aeronautics and Space Administration's (NASA's) Aircraft Noise Prediction Program (ANOPP) Version 2, which was used by the Massachusetts Institute of Technology (MIT) to assess airframe noise effects related to Boston Logan International Airport departures on an RNAV procedure. Because this Flight Procedure Evaluation is intended to determine if a concept has potential to make it through the FAA RNAV procedure development and implementation process, the FAA's approved noise model, AEDT, must be used to assess aircraft noise. ANOPP 2 is not yet recognized by the FAA as a valid model to support FAA environmental decisions. This may change in the long-term as FAA considers additional functionality in AEDT, including the ability to fully account for airframe noise changes arising from speed and configuration changes. FAA recently indicated plans to include airframe noise functionality as part of the next version of AEDT expected to be available after 2020.

SOURCE: Ricondo & Associates, Inc., October 2018.

B.2.2 CITIZEN ADVISORY COMMITTEE (CAC) MEETING #3 (AUGUST 30, 2018) INPUT AND CONSULTANT TEAM RESPONSES

DATE	NAME	REP.	CONCEPT	COMMENT ID	COMMENT FROM CAC MEMBER	RESPONSE
8/31/18	Leonard Gross	Birdrock/La Jolla	General	C-75	Thank you for all you efforts and for the selection of a such a great set of consultants. The Ricondo/Mead-Hunt team has a deep reservoir of knowledge and history, Stephen, in particular, always have a good "next level down" explanation for things that are not obvious to us amateurs. Because the FAA rules are so constraining, it is unclear that any meaningful route changes will come to La Jolla, but we certainly are getting our best shot at it!	Comment noted.
9/7/18	Robin Taylor	Sunset Cliffs/Ocean Beach	Rec. 14 - Alternative 5-ELSO to Fly By Turn at 1.5 NM (Nighttime) and Alternative 6-ELSO (Daytime)	C-76	These alternatives subject Point Loma Heights and Ocean Beach to fly overs and increased noise in areas not previously affected. Even if the study can show no impact the CNEL 65 area, the new path would end up subjecting Ocean Beach to both South and North bound traffic fly overs day and night. The population impacted by these options would be extreme (just look at a map) and all this to satisfy areas (PB, Bird Rock and LJ) who would see negligible improvement from everyday noise levels. Recommend elimination of 10 degree (ELSO) to any further study.	The consultant team recommended that the following be considered as part of the Title 14 Code of Federal Regulations (CFR) Part 150 Study update process (Part 150 Study update process) to evaluate whether they would result in a change to the area exposed to CNEL 65 and higher: (1) The 285-degree initial departure heading (or Equivalent Lateral Spacing Operations [ELSO]) from Runway 27. (2) Airport Noise Advisory Committee (ANAC) Recommendation 17, Compliance to the Nighttime Noise Abatement Agreement. (3) Other input provided by CAC members related to the initial departure heading from Runway 27 (presented on Slide 18 of the CAC Meeting #3 Presentation). Refer to response to Comment #C-2 for additional information.
9/12/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 14 - Alternative 5-ELSO to Fly By Turn at 1.5 NM (Nighttime) and Alternative 6-ELSO (Daytime)	C-77	La Jolla continues to advocate for long term night and daytime relief from commercial aircraft noise associated with NextGen Metroplex. Accordingly, we first advocate for the ongoing study of the ELSO options, including "Alternative 5 ELSO to Fly By Turn at 1.5 NM (Night time)" and "Alternative 6 ELSO Day" as described in Ricondo's presentation for the CAC Meeting #3 held on August 30, 2018. We would like to see noise modeling results focused on these alternatives, which are based on modifying the initial departure heading to direct aircraft on the runway heading (275 degrees if I understand correctly) and then intercepting a 285 degree course to the first waypoint that is further south than WNFLD during daytime hours, and/or a first waypoint located just past 1.5NM from shoreline during night time hours. This approach will keep departures further south of La Jolla. We recognize that the impact could be in the 65 CNEL area and that accordingly, the proposal may be reviewed in the Part 150 Study. The increases in flight distances are marginal (.4-.5NM) compared to PADRZ departures and are compatible with proposed ANAC recommendation 15 Nighttime Alternative 5 and with ZZOOO SID and Recommendation 15, Alternative 1. La Jolla would be in favor of the 285 degree magnetic course to first waypoint, as depicted in the yellow lines on slide 18 of the presentation, but notes the options for modeling and consideration of course headings between 285-290 degrees as compromise tracks that have the objective of concentrating flight tracks south of the current radar flight tracks on the PADRZ SID.	Refer to response to Comment #C-76.
9/12/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 14 – Alternative 1-Fly By Turn at 1.5 NM (Nighttime)	C-78	La Jolla further supports studying and noise modeling for the "Refined" ANAC Noise Recommendation 14, Alternative 1 "Fly By" Turn at 1.5 NM, for night time departures, in which the refined waypoint is located to ensure that aircraft do not turn until reaching 1.5NM. We advocate for study as to whether the BROCK2 waypoint should be designated a "Fly Over" waypoint, intended to keep planes further away from La Jolla.	The consultant team will proceed forward with the "refined" design for Recommendation 14, Alternative 1 Fly By Turn at 1.5 NM based on the design of the existing PADRZ standard Instrument Departure (SID) initial departure heading. The Federal Aviation Administration's (FAA's) guidance, defined in Order 8260.46F, *Departure Procedure Program*, paragraph 3-1-5(a), states the following regarding design of waypoints: Specify all waypoints as either fly-by or fly-over. (1) Use fly-by waypoints whenever possible. (2) Use fly-over waypoints only when operationally necessary or for obstacle clearance. (3) Design procedures using the fewest number of waypoints. The consultant team strongly recommends that the BROCK2 waypoint remain a fly-by waypoint, which is consistent with FAA guidance. The consultant team will evaluate adjusting the BROCK2 waypoint location farther west to mimic where aircraft would be if the current BROCK2 waypoint location was a fly-over waypoint along with a track-to-fix leg to ensure the inside turn dispersion of the fly-by waypoint is more predictable.
9/12/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 14 – Alternative 4-Turn Between Shoreline and 1.5 NM (Nighttime)	C-79	We further advocate for additional study and noise modeling on ANAC Noise Recommendation 14, Alternative 4 Turn Between Shoreline and 1.5NM, which will keep night time departures further south of La Jolla without affecting initial departure path predictability, while only increasing flight distance by .75NM compared to the PADRZ departure at night.	Comment noted. As stated at CAC Meeting #3, the consultant team will proceed forward with the proposed design for Recommendation 14, Alternative 4 Turn between Shoreline and 1.5 NM (Nighttime) based on the design of the existing PADRZ SID initial departure heading.
9/12/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 15 – Alternative 1-Extend JETTI	C-80	We believe the best alternative may be Alternative 1, which extends the JETTI "Fly Over" Waypoint 2NM west, which we believe will keep aircraft and noise further from La Jolla. However, we believe noise modeling is required to assess whether a fly over waypoint, prior to which speed is restricted to 230	Comment noted. The mentioned speed restriction is currently in place for the existing ZZOOO SID; therefore, any potential noise effects caused by aircraft increasing speed after the JETTI waypoint is already present. Because noise levels decrease as distance between the source and receiver increases, moving the JETTI waypoint farther west while maintaining the

DATE	NAME	REP.	CONCEPT	COMMENT ID	COMMENT FROM CAC MEMBER	RESPONSE
			Waypoint 2 NM West (Daytime)		**(continued)** knots, would result in increased acceleration engine blast noise directed at Mission Beach, Pacific Beach and La Jolla and whether that noise would be significant or marginal.	**(continued)** existing airspeed restriction would reduce noise exposure caused by the speed restriction. As stated at CAC Meeting #3, the consultant team will proceed forward with the proposed design for Recommendation 15, Alternative 1.
9/12/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 15 - Alternative 2-Fly By Turn at 1.5 NM Refined (Nighttime)	C-81	The Alternative 2 "Fly By" Turn at 1.5NM (Refined) should be studied and noise modeled. The "fly by" alternative, which includes a refined waypoint location should keep aircraft further south of La Jolla.	Comment noted. As stated at CAC Meeting #3, the consultant team will proceed forward with the proposed refined design for Recommendation 14, Alternative 2 Fly By Turn at 1.5 NM (Nighttime) based on the existing design of the PADRZ SID initial departure heading.
9/12/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 15 - Alternative 3-Fly Over Turn at 1.5 rNM (Nighttime)	C-82	We are opposed to Alternative 3, for a "Fly Over" turn at 1.5NM, which would appear to keep nighttime departures closer to La Jolla, compared to using the "Fly By" waypoint.	Comment noted. As stated in CAC Meeting #3 presentation, slide 26, the consultant team did not recommend proceeding forward with this design. The consultant team recommended to proceed with a nighttime departure procedure design that uses a fly-by waypoint that keeps traffic farther south of La Jolla. A fly-over waypoint would cause a more unpredictable turning path north of the waypoint and would place traffic closer to the La Jolla shoreline compared to a fly-by waypoint design.
9/12/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 15 – Alternative 4-Turn Between Shoreline and 1.5 NM (Nighttime)	C-83	La Jolla is interested in the noise modeling data and study of Alternative 4, where aircraft may turn west as soon as possible (at around .5NM west of the shoreline), but is concerned that engine tail orientation and acceleration blast sound waves would adversely impact Mission Beach, Pacific Beach and La Jolla. We are curious whether setting the "fly by" waypoint further offshore, such as at 1.0 or 1.5NM would be better for the La Jolla oriented coast.	Comment noted. As stated at CAC Meeting #3, the consultant team will proceed with modeling noise exposure associated with the proposed procedure for Recommendation 15, Alternative 4 Turn between the Shoreline and 1.5 NM based on the design of the existing PADRZ SID initial departure heading.
9/12/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 15 – Alternative 5-ELSO to Fly By Turn at 1.5 NM	C-84	Along those lines, La Jolla believes that Alternative 5 ELSO to Fly By Turn at 1.5NM would be optimal. We recognize that this approach would modify the initial departure heading and accordingly be subject to the Part 150 Study	Refer to response to Comment #C-76.
9/12/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 16 - Alternative 1	C-85	La Jolla is overall in strongest favor of a modified arrival path that routes traffic over the I805 and State Route 52 interchange, and accordingly over less populated and primarily industrial areas. We support further study of Alternative 1, the Modified COMIX Arrival--LNTRN to I805/SR52 to KLOMN waypoint. We are mindful of the airlines concerns about an adequate distance to both descend and slow down, and accordingly, advocate for study of the arrival path(s) used prior to implementation of NextGen Metroplex. Overall, we are strongly in favor of Alternative 1, which would include a proposed waypoint at the 805/52 intersection and raising the altitude over LNTRN. However, we are mindful of airline concerns about descending and slowing at the same time, and the impact of speed brakes on noise. We are opposed to advocating for a solution which would be deemed infeasible or unsafe by the FAA.	The consultant team is concerned about the feasibility of Recommendation 16, Alternative 1, based on input from the Technical Advisory Committee (TAC) airline representatives provided at the August 30, 2018 TAC Meeting. The consultant team shared this feedback with CAC at CAC Meeting #3, as confirmed by CAC representatives that attended the TAC Meeting. Two airline representatives expressed concerns with the existing COMIX Standard Terminal Arrivals (STAR) procedure after the altitude at the LNTRN waypoint was raised from 8,000 feet Mean Sea Level (MSL) to 9,000 feet MSL. Descending and reducing speed at the same time while maintaining compliance with the procedure or air traffic controller instructions is difficult. Pilots use all available means to descend and slow the aircraft, including the use of speed brakes (i.e., panels on the top of the wings that, when extended into the airstream, produce drag to slow the aircraft down). The use of speed brakes is a last measure for pilots to slow an aircraft, and if it does not work, they are unable to maintain procedure compliance and must inform air traffic control (ATC). The airline representatives indicated that they intend to meet with FAA to discuss their concerns related to the challenges of complying with the existing COMIX STAR procedure, which is a longer route with lower altitudes compared to Recommendation 16, Alternative 1. For these reasons, the consultant team does not recommend carrying this procedure forward. At the CAC Meeting, the consultant team was asked to determine if lowering the altitude at LNTRN in Alternative 1 to 8,000 feet MSL would mitigate the issues raised by the airline representatives. The consultant team, with the San Diego County Regional Airport Authority's (SDCAA's) assistance, will seek TAC airline members feedback on lowering altitudes for Alternative 1 to mitigate descent and speed reduction concerns.
9/12/18	Anthony Stiegler	Muirlands/La Jolla	Rec. 16 - Alternative 2 and Alternative 3	C-86	We are opposed to Alternatives 2 and 3, which do not keep commercial air traffic further from La Jolla.	As stated in CAC Meeting #3 presentation, slides 36 and 37, the consultant team did not recommend carrying forward with the referenced designs. The designs did not best meet the intent of Recommendation 16 compared to Alternative 1, and they are not preferred by CAC members representing the La Jolla area.
9/12/18	Anthony Stiegler	Muirlands/La Jolla	Schedule	C-87	We look forward to the results of additional study, recommendations and noise modeling, which we understand will either be circulated or presented on or about October 11, 2018, and/or more detailed modeling in time for the CAC November meeting.	The consultant team expects to share the final design concepts with the CAC in October and to share noise screening results in December.
9/12/18	Gernot Trolf	Mission Beach	Initial Departure Heading	C-88	As the designate for Mission Beach my recommendation would be for night time and early morning departures to be as close as possible over the San Diego river. I believe it is heading 290. Additionally I believe a steeper climb would be in order. There is not much leeway to recommend anything else short of moving the airport.	Refer to response to Comment #C-76.
9/12/18	Dave Kujawa	Ocean Beach	General	C-89	I appreciate your efforts to simplify the presentations and impose more order during the meeting. I thought the second meeting was an improvement on the first (although I did talk to a few people after and one of them said that their "head was still spinning").	Comment noted.
9/12/18	Dave Kujawa	Ocean Beach	TAC Membership	C-90	Although probably too late to change, I did also want to formally object in writing to the policy that allows the same people to sit on both the TAC and on the CAC. This policy reduces the number of	The CAC representatives that serve on the TAC were nominated and elected by the CAC membership at the first CAC Meeting on March 22, 2018. The consultant team presents the same information to TAC and CAC and considers input from

DATE	NAME	REP.	CONCEPT	COMMENT ID	COMMENT FROM CAC MEMBER	RESPONSE
					(continued) independent thinkers on the committee and reduces public access to participate in the process. I also assume that the ANAC noise recommendations were crafted at least in part by some of these same people currently on the TAC and the CAC. Again, having the same people involved limits the discussion and reduces the opportunity for other members of the public access to adequately participate in the process.	**(continued)** both groups prior to formulating recommendations. As discussed at the CAC kick-off meetings, each CAC member is expected to represent the interests of the community in which they reside. Both meetings are open to the public, and presentations are provided to the public via the SDCRAA's website so that interested community members have an opportunity to reviewing the information shared with the CAC and provide feedback to their CAC representative. The two CAC members elected by CAC to participate at TAC meetings are expected to represent the CAC input, not just the communities that each individual represents.
9/12/18	Dave Kujawa	Ocean Beach	Rec. 14 - Alternative 5-ELSO to Fly By Turn at 1.5 NM (Nighttime) and Alternative 6-ELSO (Daytime); Rec. 15 – Alternative 5-ELSO to Fly By Turn at 1.5 NM	C-91	As for the specific of the meeting, I am opposed to pursuing the newly presented: 1. "Alternative 5 (new) – ELSO 285° to Fly By waypoint at 1.5 NM thence to BROCK-2 – Nighttime" 2. "Alternative 6 (new) – ELSO 285°- Daytime" 3. "Alternative 5 (New) – ELSO 285° to Fly By waypoint at 1.5 NM then to ZZOOO – Nighttime" As shown in slide 18, these proposals would shift the noise further south and concentrate flights over Ocean Beach. Thus, these plans do not "share the noise." Rather, they would substantially shift the current air traffic as seen in slide 18. Residents that do not currently experience direct flights overhead will not be pleased at all with this proposal. Moreover, I think it's obvious that such a change would require a change the contour of the CNEL 65 area. Thus, I do not think it is worth studying further. I also note that while the departure headings all look fairly close together on paper, I live directly under the current southernmost flight path shown in slide 18 (heading towards JETTI) and the difference in noise experienced at my house between planes departing on that heading and those departing on the current northernmost heading (toward WP71 in slide 18) is significant (obviously much louder for those flying the JETTI route). Thus, I know that changing the heading to WP76 as shown in slide 18 will significantly increase noise exposure to all residents of Ocean Beach. I also don't think that this change will significantly reduce noise in other northern neighborhoods. Thus, I am opposed to these proposals.	Refer to response to Comment #C-76.
9/12/18	Dave Kujawa	Ocean Beach	General	C-92	The other proposals [proposals that do not include ELSO heading] discussed during the meeting seemed reasonable and worthy of further study.	Comment noted.
9/12/18	Mike Tarlton	Ocean Beach	Rec. 14 - Alternative 3-Fly By Turn at CNEL 65 (Nighttime), Alternative 5-ELSO to Fly By Turn at 1.5 NM (Nighttime) and Alternative 6-ELSO (Daytime); Rec.15 – Alternative 5-ELSO to Fly By Turn at 1.5 NM	C-93	As I have stated in the past, I am adamantly opposed to any proposals in the chart deck that shift noise south from Mission Beach onto Ocean Beach residents. Specifically, for "Noise recommendation 14, I am opposed to pursuing: 1. Alternative 3 – Fly By Turn at CNEL 65 contour – Nighttime. 2. Alternative 5 (new) – ELSO 285° to Fly By waypoint at 1.5 NM thence to BROCK-2 – Nighttime 3. Alternative 6 (new) – ELSO 285°- Daytime For Noise recommendation 15, I am opposed to pursuing: 1. Alternative 5 (New) – ELSO 285° to Fly By waypoint at 1.5 NM then to ZZOOO – Nighttime Finally, it goes without saying, but I am also adamantly opposed to any composite recommendation that combines Recommendations 14 and 15 using the individual alternatives I listed above. As I am sure you are aware, all of the proposals I listed above would shift noise south and concentrate flights over Ocean Beach. Thus, these plans do not "share the noise." Rather, they would substantially shift the current air traffic as seen in slide 18 from Mission Beach to Ocean Beach. Residents that do not currently experience direct flights overhead will now experience significantly increased aircraft noise. Moreover, I am certain that such a change would require a change the contour of the CNEL 65 area. Thus, I do not think it is worth studying further. Additionally, while the departure headings all look fairly close together on paper, I live directly under the current southernmost flight path and the difference in noise experienced at my house between planes departing on that heading and those departing on the current northernmost heading is significant. It is much louder when aircraft fly toward JETTI that toward WP71 on chart 18. Thus, I know that changing the heading to south to WP76 as shown in slide 18 will significantly increase noise exposure to all residents of Ocean Beach. Ultimately, I am opposed to the above listed alternative proposals because they all push noise south onto Ocean Beach residents for the benefit of Mission Beach residents. As an Ocean Beach resident, I do not believe this is fair or reasonable.	Refer to response to Comment #C-76.
9/12/18	Mike Tarlton	Ocean Beach	General	C-94	The other proposals discussed during the meeting seemed reasonable and worthy of further study.	Comment noted.
9/13/18	Marie Knox	La Mesa	East County	C-95	I would like to start by commenting that East County was not represented in the ANAC subcommittee recommendations done in 2017. That has put East County at a disadvantage in the Part 150 Update because there are no recommendations regarding reducing noise in East County in the ANAC recommendations used to model this study.	SDCRAA announced at the August 30, 2018, CAC Meeting #3 that they intend to form an East County working group focused specifically on seeking opportunities to address San Diego International Airport (SDIA) arrival noise concerns over East County. One of the reasons for the working group is because East County was not involved in the ANAC Subcommittee. The Authority is working with the East County ANAC representative to identify representatives for communities in East County.

DATE	NAME	REP.	CONCEPT	COMMENT ID	COMMENT FROM CAC MEMBER	RESPONSE
9/13/18	Marie Knox	La Mesa	Class B Airspace	C-96	East County has been added onto the discussion in the Aug. 30th CAC meeting as the last item. The suggestion is that Class B airspace be changed. I spoke to Wayne Reiter at Montgomery Field Airport, who sits on the ANAC, about this suggestion and he said that lowering Class B airspace would cause an increase in noise in those areas where the airspace is lowered, it would push general aviation lower and he has not seen the FAA change any airspace in San Diego in the 20 years he has worked at Montgomery Field Airport. With that information, I do not see how that would be a feasible option. I called the Lead Airport Planner Manager, Jaime Duran, at the FAA Western Pacific Region, to as him if he thought that lowering Class B airspace in San Diego would be a feasible solution. He did not return my call and I have not been able to get in touch with him on the phone. I will send him a letter and ask him in writing. I will let you know what his response is.	The FAA's proposed Class B change for Area K, which is depicted on slide 41 of the August 30, 2018, CAC Meeting PowerPoint slides, would lower the floor in Area K from 4,800 feet MSL to 4,000 feet MSL. If general aviation aircraft that do not want to or cannot enter the Class B airspace, they must stay below 4,800 feet today. If the FAA implements the proposed change, general aviation aircraft would need to stay below 4,000 feet MSL. Consistent with Mr. Wayne Reiter's feedback, lowering the Class B airspace has the potential to increase aircraft noise on the ground, which would require the FAA to conduct an environmental review, including announcing the intent to implement the change in the Federal Register. The public would have the opportunity to comment on the change through these processes. Lowering the Class B floor in Area K could provide an opportunity to route SDIA arrivals along the corridor in which they were located prior to the procedure change in November 2016.
9/13/18	Marie Knox	La Mesa	Rec. 16 – Alternative 1	C-97	As far as the ANAC Noise Recommendation #16 to reduce arrival noise over La Jolla by modifying COMIX arrival Lantern to I805/SR52 to KLOMN waypoints, I would comment that if doing that increases noise anywhere in East County, then it should not be considered.	Under the proposed design concept, traffic would be directed to the same KLOMN waypoint, located northwest of East County, that exists today. The proposed design concept is not expected to change the existing SDIA arrival traffic patterns over East County.
9/13/18	Marie Knox	La Mesa	Sweetwater Visual Approach	C-98	My suggestion for reducing noise in La Mesa, would be to ask TRACON to simply use the Sweetwater Visual which is the FAA published route. Stephen Smith of Ricondo and Assoc, says that this route is not being used and when I ask him what route is being used, he said he doesn't know. I ask that this study ask the FAA to follow their own procedures and use the Sweetwater Visual and if they are not using it, what route are they using? And on the route they are using, ask if there has been and Environmental Assessment and an Environmental Impact Study made on the route being used? And if so, how would I find that information.	The Sweetwater Visual charted visual approach is not a required procedure. A user must request the procedure, and FAA air traffic control would approve it depending on traffic conditions. In a previous meeting with the FAA Southern California TRACON (SCT), FAA indicated that receive few user requests for the charted visual approach. The commenter raises a good question, and the consultant team recommends further discussion with FAA as part of the East County effort. After aircraft on the COMIX STAR pass the KLOMN or NADDO waypoint, air traffic controllers issue headings, and speed and/or altitude restrictions to merge the traffic on to the final approach to Runway 27. Controller have issued assigned headings and speed and/or altitude restrictions for many years. The procedure added between the KLOMN and NADDO waypoint was implemented in November 2016 as part of the BAYVU 5 amendment. According to FAA, it determined that the procedure was categorically excluded from review under the National Environmental Policy Act (NEPA). The FAA added the Required Navigation Performance (RNP) approach to Runway 27, which starts at the KLOMN waypoint. The RNP approach is similar to the Sweetwater Visual charted visual approach, but it requires certified aircraft and authorized pilots to use the procedure. Approximately 50 percent or less of the operators are capable of using the procedure. This approach was evaluated as part of the SoCal Metroplex Environmental Assessment Proposed Action alternative.
9/13/18	Marie Knox	La Mesa	East County Working Group	C-99	Finally, thank you for agreeing to start a group to address the noise concerns for East County specifically. I wanted to ask if you have made in progress with this group. And I hope that a person has been chosen to represent South Park to sit on the CAC to take the place of David Twining.	Comment noted. Progress has been made to identify potential East County community representatives with the assistance of the ANAC East County representative.
9/13/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Requested Information	C-100	Disappointingly, the questions and requests of my email of August 28th were not fully addressed in the most recent TAC nor CAC meetings. I strongly believe that to incorporate these questions, answers and details as well as those from other CAC members into the pre meeting consultants considerations would have, as stated by a senior SDCRAA representative, "help[ing] spur discussion between CAC members, [it will] help ensure that everyone has the same information to inform their perspectives" and, in my view, promote a consensus recommendation. To not do so casts a shadow on the validity of this portion of the process, which it should be noted, is now entering its fourth year.	Refer to responses to Comments #C-12 through #C-36.
9/13/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Level of Modification	C-101	First and foremost, the consultant presentation is missing a critical component that should describe an evaluation of ANY option relative to the feasibility to gain FAA approval and implement the alternative. To evaluate the consultant alternatives to gain a CAC recommendation without understanding the respective feasibility of the alternative is a fool's errand and diminishes the credibility of this process. The consultants need to fully disclose as to each alternative, the type of modification as described below, as well as the respective time lines and hurdles to accomplish as the relative timeframes and challenges to obtain the various FAA approvals are substantially different: a. "minor modification to an existing SID", b. "new SID" or c. "major modification to an existing SID";	The consultant team will provide professional judgement on the degree of change each proposed concept will involve. The commenter should understand that the final determination related to the degree of change is made by the FAA after the agency completes the first step in the performance based navigation (PBN) implementation process.
9/13/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Order of Discussion	C-102	As one who is very familiar with the concepts being presented, I (along with other CAC members) continue to find it very difficult and frustrating to attempt to track the consultants progression of options across both nighttime and daytime applications. The consultants presentation slides nor their discussion do not clearly segregate nor identify the significant difference between daytime and nighttime issues and goals as established by the ANAC Subcommittee, In fact, the Nighttime Noise Abatement Procedure issues were contained within ANAC Subcommittee recommendation #17, which is not currently being directly addressed, NOT recommendations 14 and 15. This nighttime\daytime separation and understanding is critical for CAC members to fully evaluate the options presented as they have materially different issues and goals to consider.	Refer to response to Comment #C-103 related to separating daytime and nighttime concepts for future presentations. At the first CAC meeting on March 22, 2018, the consultant team informed CAC that Recommendation 17 would be addressed and evaluated under the Part 150 Study update process.

DATE	NAME	REP.	CONCEPT	COMMENT ID	COMMENT FROM CAC MEMBER	RESPONSE
9/13/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Order of Discussion	C-103	Therefore, I would again, strongly suggest that the slides and the discussion order be revised to reflect as noted below, Daytime issues and alternatives and then Nighttime issues and alternatives (by adding recommendation #17): Doing so would significantly aid in the discussion: a. recommendations 14 & 15 "Daytime" operations i. right turn ii. left turn b. recommendations 14 & 15 "Nighttime" operations i. right turn ii. left turn c. recommendation 16 d. recommendation 17	The consultant team will organize the Final concepts presentations for the final proposed concept designs in a manner similar to the commenter's request.
9/13/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Fly By versus Fly Over Waypoint	C-104	I remain unconvinced that the alleged predictability of "fly by" waypoints versus "fly over" would cause a favorable impact to the beach communities as it implies that ATC will respect the intent, which we know to be a bold assumption. Our day to day experience clearly demonstrates significant room for broad ATC interpretation of what is allowable for "fly by" versus a very clear definition for "fly over", arguably conflicting with the consultants recommendations.	As long as FAA air traffic controllers keep the aircraft on an Area Navigation (RNAV) Standard Instrument Departure (SID), one can expect the aircraft to operate close to the designed path. The consultant team's proposed "track-to-fix" designs and "start of turn anticipation" calculations for nighttime procedures indicate that traffic on the RNAV SID are expected to operate along a more predictable path compared to the "fly-over and direct-to-fix" design of the existing ZZOOO SID. Some variance, due the different types of Flight Management Systems (FMS) equipped on an aircraft and aircraft performance, should be expected, but not to the level presently observed at the ZZOOO waypoint. Based on evaluations conducted by SDCRAA, compliance with 1.5 NM turn agreement has substantially improved since the existing RNAV SIDs were implemented. As long as FAA air traffic controllers keep aircraft on the RNAV SID procedure, aircraft should predictably operate as expected. The primary mission of air traffic control is to provide the safest and most efficient air traffic system; therefore, air traffic controller intervention is warranted at time to maintain the dynamic nature of the ATC system. For this reason, 100 percent compliance with the procedures should not be expected.
9/13/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 17	C-105	I am unaware of any ANAC Subcommittee goal to "move" nighttime traffic south from LJ. The primary ANAC Subcommittee goal (#17) was to "…ensure that ATC is only turning aircraft off this procedure (the 290 heading) for safety reasons only." That is to say, get the traffic reliably BACK to the long term agreement defined by the 290 heading and OFF of the new TRACON habit of nighttime departures on the PADRZ SID (294 degrees). It was established by the consultants (Rob) during the last CAC meeting that the magnetic heading for "PADRZ TWO" was 294 degrees; therefore, ANY nighttime departure exiting on a PADRZ SID is in violation of the Nighttime Noise Abatement Procedure. It would also be highly appropriate for the consultants to recognize that PADRZ is NOT consistent with the Nighttime Noise Abatement Procedure and to support the position that recent use of the PADRZ 294 degree departure for the Nighttime Noise Abatement Procedure is not precedent setting as it is in direct violation of the established long term agreement.	ANAC Recommendation 14 states: "Revise PADRZ SID or create a new procedure to reduce increased noise in La Jolla, Mission Beach and Pacific Beach." The PADRZ SID serves daytime and nighttime departures to the north/northwest. Therefore, the intent of ANAC recommendation is to include both daytime and nighttime traffic and identify concepts that would move the traffic farther south of La Jolla. The consultant team confirmed this intent with CAC at the first CAC Meeting on March 22, 2018. Please refer to the response for Comment #C-76 comment related to the ANAC Recommendation 17 and initial departure headings from Runway 27.
9/13/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 17	C-106	While clearly recognizing that magnetic headings for future solutions may not be highly relevant to the consultants, magnetic headings and the point of axis\vertex (end of runway, 520' above MSL, etc) provide an important context and have a very strong role in the historical precedent setting facts that will directly influence what alternatives should be considered fair to all communities. Therefore, in the effort to respect historical agreements and to maintain a fair and historical impact on communities (i.e. Ocean Beach versus Mission Beach), we should recognize that magnetic headings and their axis are important and relavent. Therefore, again, please Identify the current magnetic headings for: a. end of runway to LANDN; b. 520' MSL to LANDN (est, recognizing this is a moving point) c. end of runway to WNFLD; d. 520' MSL to WNFLD e. end of runway to AN14-1; (Rec 14, Alt 1) f. 1.5 NM from shoreline (Rec 14, Alt 1); g. 520' MSL to AN14-1 h. end of runway to WP 7.1?? i. 0.5 NM from shoreline (Rec 14, Alt 4) j. End of runway to Noise Dot #1 k. 520' MSL to Noise Dot #1 l. End of runway to Noise Dot #2 m. 520' MSL to Noise Dot #2	As requested, the following table depicts the magnetic heading and true course (course over the surface in reference to the North Pole) between two points designated by the commenter. The magnetic and true course headings related to A14-1 and WP71 waypoints are based on the final design concepts, which were refined since the last versions for Rec. 14 Alternative 1/Rec. 15 Alternative 2 (Nighttime) and Rec. 14 Alternative 4/Rec. 15 Alternative 4 (Nighttime) were shown to CAC on August 30, 2018. To provide historic context, the magnetic heading and true course prior to the magnetic variation change in 2016 is provided. The true course never changes over time, but magnetic variation does over the years. Using the measured true courses between the points requested by the commenter, the table below depicts what the magnetic heading would have been prior to the magnetic variation change in 2016 and what it is after the change. The table also provides the initial headings for the PEBLE and BORDER Conventional SIDs prior to and after the magnetic variation change. The true course over the ground never changed when the PEBLE and BORDER SIDs were updated to account for the magnetic variation change. The "520' above MSL" point varies for each unique flight on a given day due to aircraft performance. The point where an aircraft will reach 520' Mean Sea Level (MSL) ranges between prior to the end of Runway 27 to just under one mile from the departure end of Runway 27. The commenter recognizes this is a moving point. For purposes of the commenter's request, the point used to measure the magnetic and true course heading is where at least half (50 percent) of all jet departures on the PADRZ SID reach 520' MSL. This does not mean aircraft reaching 520 feet MSL prior to or after this point is not in compliance with the PADRZ SID. In fact, they are in compliance. Based on a month of ANOMS radar track data, approximately 50 percent reach 520' MSL at a point approximately 820 feet west of the departure end of Runway 27.

<table>
<tr><th>DATE</th><th>NAME</th><th>REP.</th><th>CONCEPT</th><th>COMMENT ID</th><th>COMMENT FROM CAC MEMBER</th><th>RESPONSE</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>(continued) n. Identify what magnetic deviation you are using; within the past 24 months, FAA revised the full complement of SID's with a new deviation factor. While these changes would likely be minimal, they do come into play and clarity on the matter would be helpful.</td><td>(continued)
<table>
<tr><th></th><th colspan="2">11-DEGREE MAGNETIC VARIATION (2016-CURRENT)</th><th colspan="2">14-DEGREE MAGNETIC VARIATION (1965-2015)</th></tr>
<tr><th></th><th>MAGNETIC HEADING</th><th>TRUE COURSE</th><th>MAGNETIC HEADING</th><th>TRUE COURSE</th></tr>
<tr><td>a. End of Runway to LANDN</td><td>293</td><td>304</td><td>290</td><td>304</td></tr>
<tr><td>b. 520' to LANDN</td><td>293</td><td>304</td><td>290</td><td>304</td></tr>
<tr><td>c. End of Runway to WNFLD</td><td>292</td><td>303</td><td>289</td><td>303</td></tr>
<tr><td>d. 520' to WNFLD</td><td>292</td><td>303</td><td>289</td><td>303</td></tr>
<tr><td>e. End of Runway to AN14-1</td><td>291</td><td>302</td><td>288</td><td>302</td></tr>
<tr><td>f. End of Runway to 1.5NM from Shoreline</td><td>No Waypoint Exists in Proposed Design Concepts-Refer to e.</td><td>No Waypoint Exists in Proposed Design Concepts-Refer to e.</td><td>No Waypoint Exists in Proposed Design Concepts-Refer to e</td><td>No Waypoint Exists in Proposed Design Concepts-Refer to e</td></tr>
<tr><td>g. 520; to AN14-1</td><td>291</td><td>302</td><td>288</td><td>302</td></tr>
<tr><td>h. End of Runway to WP 71 [now WP88]</td><td>292</td><td>303</td><td>289</td><td>303</td></tr>
<tr><td>i. End of Runway to 0.5 NM from Shoreline</td><td>No Waypoint Exists in Proposed Design Concepts-Refer to h.</td><td>No Waypoint Exists in Proposed Design Concepts-Refer to h.</td><td>No Waypoint Exists in Proposed Design Concepts-Refer to h.</td><td>No Waypoint Exists in Proposed Design Concepts-Refer to h.</td></tr>
<tr><td>j. End of Runway to Noise Dot #1</td><td>299</td><td>310</td><td>296</td><td>310</td></tr>
<tr><td>k. 520' to Noise Dot #1</td><td>298</td><td>309</td><td>294</td><td>309</td></tr>
<tr><td>l. End of Runway to Noise Dot #2</td><td>287</td><td>298</td><td>284</td><td>298</td></tr>
<tr><td>m. 520' to Noise Dot #2</td><td>287</td><td>298</td><td>284</td><td>298</td></tr>
<tr><td>n. Current Magnetic Variation: 11-degrees</td><td></td><td></td><td></td><td></td></tr>
<tr><td>PEBLE SID Initial Heading</td><td>293</td><td>304</td><td>290</td><td>304</td></tr>
<tr><td>BORDER SID Initial Heading</td><td>278</td><td>289</td><td>275</td><td>289</td></tr>
</table></td></tr>
<tr><td>9/13/18</td><td>Casey Schnoor</td><td>Sunset Cliffs/Fleetridge</td><td>Rec. 14 – Daytime/Nighttime</td><td>C-107</td><td>Recognizing that the fairness of a solution is influenced by factors that may be somewhat outside of the consultants scope, the context of the historical agreements and shifting of impacts back to former historical position are important and consistent with the ANAC Subcommittee efforts.
I believe that a very viable solution that meets the ANAC Subcommittee and historical criteria would be a minor PADRZ modification:
a) move WNFLD and LANDN slightly south (by 0.35 NM +-, approximately 2,100'; not the few hundred feet as described by the consultants in the meeting) to a location with an axis bearing 290 degrees from preferably:
(i) AN14-1 (as a "flyby"), or
(ii) an estimated point at "climb to 520' MSL" (not as clearly defined), and
b) revise the newly located WNFLD to a "fly over".
I firmly believe that this alternative could provide a very "historically fair" community solution while effecting a "minor" adjustment to an existing SID, as well as:</td><td>The commenter's suggestion involves an adjustment that changes overflight patterns over areas exposed to CNEL 65 or higher noise levels. Refer to response to Comment #C-12.</td></tr>
</table>

DATE	NAME	REP.	CONCEPT	COMMENT ID	COMMENT FROM CAC MEMBER	RESPONSE
					(continued) (i) feasibly replace the Nighttime Noise Abatement Procedure with a formal SID (the revised PADRZ), rather than ATC vectoring (ii) meet the ANAC Subcommittee goal of moving PADRZ SID departures to the original 290 degrees (iii) maintain the 15 degree separation (iv) avoid significant challenges by relocating impacts south of previously established routes (south of 290 degrees as in the 285 degree ELSO proposal) (v) Offer a "minor" adjustment to an existing SID that may require a "NextGen adjustment", thereby less FAA review and approval hurdles, over a shorter period Therefore, may I request that you please incorporate this specific alternative with those to be considered and discussed in our October CAC meeting as a solution to Recommendation #14 daytime, Recommendation #14 and #15 Nighttime and Recommendation #17.	
9/13/18	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 16	C-108	Please reconsider all potential options for Recommendation #16. Prior to the more recent FAA changes, impacts from arrivals were far less negative. Also recognizing that not all current increases in negative impacts are a result of aircraft design that constrain the descent. So, as Mr. Harris has attempted to point out, a current solution should lie in the consultants understanding of the historical routes. In my opinion, to offer no firm alternatives nor recommendations to address this significant problem is not remotely close to an acceptable position for CAC, nor does it reach to meet the ANAC Subcommittee goals	The consultant team plans to proceed with Recommendation 16, Alternative 1, if an adjustment can be made that addresses concerns shared by the TAC airline representatives. La Jolla CAC members indicated a preference for Alternative 1 *if* it would not impact safety. A La Jolla CAC member recommended considering lowering the altitude at LNTRN, and another inquired about airspeed. The consultant team will seek input from the TAC airline representatives and FAA regarding the suggestions. The airlines/users input is critical to determining feasibility of air traffic procedures. During the PBN implementation process, FAA will seek airline and user feedback on a proposed procedure design. The consultant team's past experience with this process indicates that user and/or airline concerns can result in a procedure design being rejected. Ultimately, if a user or airline will not accept a procedure, it will never be used. If FAA expects use to be very low, the FAA will not implement the procedures due to the limited benefit it would provide. Safety concerns about a procedure typically result in rejection of the design concept.
9/13/18	Alan Harris	Pacific Beach	Rec. 16 - Alternative 1	C-109	Speaking with other commercial airline pilots I submit the follow comments modeling and future study. Recommendation 16, Alt 1 Arrivals 1. Drop the initial approach airspeed below 230k…closer to 210k [A. Harris sent email on 9/14/18 to correct "below 200k airspeed" to "below 230K…closer to 210K"]... this will solve the issue of too fast approach that was a concern of the Pilot into SAN. It will have minimal impacts to additional fuel and time in the air. The airline priorities of getting on the ground sooner should not come at the expense set of residents on the ground. The current path of design is setting up any recommendation as an automatic failure. 2.The CAC recommendation was not to shift air traffic to Del Mar, but to shift traffic back to pre Next Gen flights.	The existing COMIX STAR restricts airspeed at 230 knots at LNTRN waypoint, and 210 knots at the KLOMN waypoint. Alternative 1 maintains these same airspeed restrictions. The consultant team, with SDRCAA's assistance, will seek input from FAA and the TAC airline representatives to determine if it is feasible to reduce the airspeed over LNTRN waypoint from 230 to 210 knots. Recommendation 16, Alternative 1, does not cross over Del Mar. At CAC Meeting #3, the consultant team indicated that, based on a proposal from a CAC member during the CAC Meeting #2, aircraft would fly over Del Mar to go direct to KLOMN from the COMIX waypoint. The consultant team did not recommend the proposal because it would relocate traffic over the Del Mar community.
9/13/18	Leonard Gross	Birdrock/La Jolla	General	C-110	Thanks for the reminder. Fortunately, most of my questions got answered at the meeting.	Comment noted.

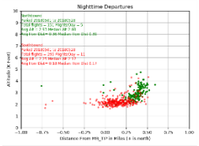
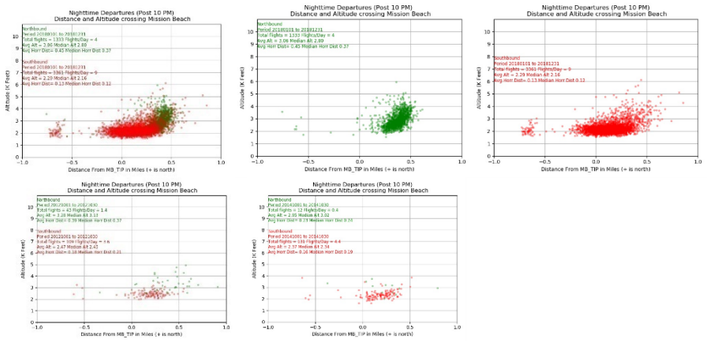
SOURCE: Ricondo & Associates, Inc., October 2018.

B.2.3 CITITZEN ADVISORY COMMITTEE (CAC) MEETING #5 (MARCH 28, 2019) INPUT AND CONSULTANT TEAM RESPONSES

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
3/28/19	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 13	C-111	I believe that a thorough review of the RIC Recommendations against ALL of the specific and detailed elements, i.e. background/rational and procedure suggestions of the unanimously SDCRAA approved ANAC Subcommittee Recommendations (please see attached original) is merited by Riconco, TAC and CAC, as many of the details of the Subcommittee goals are not being addressed by Riconco nor included within the RIC Recommendations	The consultant team considered the recommendations for air traffic procedures approved by ANAC on October 18, 2017, and reviewed all ANAC subcommittee suggestions for each recommendation, as follows: ▪ At the first CAC meeting on March 22, 2018, the consultant team reviewed each ANAC recommendation to confirm with the CAC which recommendations would be assessed. The consultant team then assessed the feasibility of the ANAC subcommittee suggestions for those recommendations. ▪ The consultant team presented the results of the feasibility assessment of ANAC subcommittee suggestions at the July 19, 2018, CAC meeting. The consultant team briefed CAC the reasons why specific suggestions were considered not feasible. For feasible ANAC subcommittee suggestions, the consultant team presented details on multiple procedure concepts, including the rationale for and purpose of the concepts. This procedure evaluation process was iterated over three more CAC meetings. The consultant team considered CAC input (during meeting discussions as well as responses to written comments) to ensure proposed procedure designs were consistent with the goals and intent of the overarching ANAC recommendation. Throughout this process, concepts were modified and eliminated based on CAC and TAC input, as well as based on noise screening results. Procedure design concepts were subject to noise screening. If a concept was found to increase noise levels, the consultant team did not recommend carrying the concept forward. As such, Recommendation 16 Alternative 1 was eliminated from further consideration because of the potential noise increases the change will cause. The proposed nighttime RNAV jet departure procedures for Recommendation 14 and 15 would provide a qualitative noise benefit to communities, such as La Jolla and Point Loma, although the consultant team determined that the procedures should be withheld from further consideration until Recommendation 17 (nighttime noise abatement heading) is addressed under the Part 150 Study update process based on CAC comments. Refer to response to Comment C-59 for the reason Recommendation 17 will be evaluated under the Part 150 Study. The proposed change to the daytime eastbound jet departure procedure (ZZOOO SID) positively addressed the intent of Recommendation 15. Based on noise screening results, although the consultant team advised CAC of potential concerns by FAA and the airlines related to the increase in flight distance. In conclusion, the only ANAC recommendation that could not be addressed was ANAC Recommendation 16. In support of this recommendation, the consultant team evaluated seven different RNAV arrival procedure designs. Several designs were based on suggestions from the ANAC subcommittee. Five of the seven procedure designs were eliminated based on CAC feedback for not meeting the intent of Recommendation 16. One design was eliminated due to aircraft performance and safety concerns expressed by a TAC airline representative. The one remaining design (Recommendation 16 Alternative 1 Version 3) was determined to cause a noticeable increase in noise levels in some communities. In summary, the consultant team was unable to identify a feasible procedure design to meet the intent of ANAC Recommendation 16.
3/28/19	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 17	C-112	The Nighttime procedure proposals represented within the attached presentation have a material baseline flaw. Ricondo is using Recommendation 14 and 15 for Nighttime applications, however, these RIC Recommendations are mute on the application of Recommendation 17. The intent of Recommendation 17 was to maintain and enforce the Nighttime Noise Abatement Procedure (Letter Agreement; SCT\SAN\ATCT) that calls for a 290 departure heading for both left and right turns. The RIC Recommendation 14/15 procedure specifically calls for PADRZ (295) SID departure routing for nighttime. This is in direct conflict with the intent of ANAC recommendation #17 and the Nighttime Noise Abatement Procedures (i.e. 290 degree departures). It also suggests a new but undefined waypoint that appears consistent with a 295 departure heading. The recently sent\posted "update on ANAC Recommendations" states that recommendation #17 is; "In Process; Consultant will be reviewing this in the Part 150 Study update." This is flawed reasoning\process as; a) the waypoints and departure routes are clearly impacting area outside of the 65dB CNEL contour\Part 150 study, and b) the existing 290 heading of the Nighttime Procedure should be maintained in this Flight Procedure Analysis process as the existing "base line", and only changed, if deemed appropriate in conjunction with the Part 150 (as your memo states), not the reverse as proposed. Please also note that Ricondo has previously been informed of this inconsistency with Recommendation #17	Refer to response to Comment #C-12 regarding Recommendation 17 and the nighttime noise abatement heading. CAC members suggested multiple alternatives for the nighttime noise abatement heading. The consultant team recommended that these alternatives be evaluated as part of the Part 150 Study update process. The Recommendation 14 and 15 nighttime departure procedure designs follow the initial heading of the existing PADRZ RNAV to maintain existing traffic patterns over areas exposed to CNEL 65 and higher. Because northbound and eastbound traffic would share the same right turn path, FAA would require the same initial heading in the RNAV procedure design for these two traffic flows. The consultant team advised CAC at the March 28, 2019, meeting to consider holding the recommended nighttime departure designs for Recommendation 14 and 15 from further consideration given dependences with Recommendation 17 (initial noise abatement departure heading from Runway 27 that the nighttime departure procedure designs would share). Based on comments received after the meeting, the consultant team recommends holding Recommendation 14 and 15 nighttime departure procedure designs until Recommendation 17 is addressed under the Part 150 Study update process. If a recommended nighttime noise abatement initial heading is proposed for Recommendation 17 during the study, the final design for the nighttime departure procedure design concepts related to Recommendation 14 and 15 may be modified to accommodate the heading.
3/28/19	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 14 Alternative 1 and 4/Rec. 15 Alternative 2 and 4	C-113	Various portions of the detailed elements, i.e. background/rational and procedure suggestions in ANAC #14 have not been addressed or were quickly dismissed by Riconco. RIC Recommendation: 14 Alternative 1 Version 2 and 15 Alternative 2 Version 2 (slide 10 Nighttime) – Was not addressed in the final RIC Recommendations for undeclared reasons	As described in response to Comment #C-111, the consultant team reviewed the feasibility of all ANAC subcommittee suggestions for the ANAC recommendations and presented the results of the feasibility assessment at the July 19, 2018, CAC meeting. The consultant team then developed multiple procedure concepts for feasible suggestions and assessed the concepts in the three-phase traffic procedure evaluation process. The consultant team briefed CAC members of each concept and provided responses to specific comments from CAC members throughout the process.

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
					(continued) RIC Recommendation ANAC 14 Alternative 4 (slide 18 Nighttime) – Proceed forward for further consideration (note: would require lifting 1.5 nautical mile early turn restriction at night); [note: highlighted by commenter] RIC Recommendation ANAC 15 Alternative 4 (slide 18 Nighttime) – Proceed forward for further consideration (note: would require lifting 1.5 nautical mile early turn restriction at night) [note: highlighted by commenter]	**(continued)** Recommendation 14 Alternative 1 Version 2 and Recommendation 15 Alternative 2 Version 2 were not recommended to be carried forward because they are similar to Recommendation 14 and 15 Alternative 4. Procedure concepts for both were designed to meet the same intent, and the FAA would not implement both because they serve the same traffic at the same time. The consultant team recommended Recommendation 14 and 15 Alternative 4 because it provides more distance between the route and the La Jolla area compared to Recommendation 14 Alternative 1 and 15 Alternative 2. If FAA finds Recommendation 14 and 15 Alternative 4 is not feasible during their RNAV procedure evaluation process, Recommendation 14 Alternative 1 and 15 Alternative 2 could serve as a revised design for FAA consideration. The consultant team advised CAC that the procedure design for Recommendation 14 and 15 Alternative 4 would require FAA to lift the early turn restriction on aircraft assigned the departure procedures between 10:00 p.m. and 6:30 a.m. because the procedure includes a turn prior to 1.5 nautical miles from the shoreline.
3/28/19	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 14 Alternative 1/Rec 15 Alternative 2	C-114	I do not support these 2 RIC Recommendations for the following: 1. flawed base line using ZZOOO and PADRZ (slide 10 clearly shows this proposed procedure aligning with WNFLD\LANDN at 295 degrees) rather than 290 Nighttime Noise Abatement Procedure (Letter Agreement; SCT\SAN\ATCT); Nighttime routing deteriorated by acceptance of PADRZ and ZZOOO departures in lieu of 290, negatively impacting OB, MB and BR (slide 16); this appears to be an attempt to eliminate the long standing 290 departure heading commitment 2. Undefined location of proposed Fly By Way Point; Fly By Way Point should be "Fly Over WP" to assure their statement of "a waypoint to provide a more predictable path" (as in the predictability of JETTI) 3. Left turns are clearly too close to shoreline at 0.5 NM; Nighttime routing deteriorated by turns allowed at 0.5 NM off shoreline versus 290 past JETTI, negatively impacting OB, MB and BR, but improvements to LJ (slide 22/23); 4. Noise comparison charts (slides 15/16) do not reflect turn closer to shoreline, do not reflect at 290 departure heading; creates a false "baseline" (at 295 vs. 290 degree headings) for noise comparisons; proposed left turns for a Fly By commencing prior to 0.5 NM from shoreline will predictably redirect jet wash noise toward Bird Rock and Mission Beach notably 1 full mile +- closer and therefore lower to shoreline, than a Fly Over WP in the same location (slide 16); 5. Validates a "new normal" for nighttime departures directed onto PADRZ, at 295 degrees 6. Memorializes the recent increased negative impact incurred by Mission Breach and Bird Rock from the ATC shift away from the Nighttime procedure to PADRZ.	1. The consultant team developed the baseline screening model on radar track data from the Authority's ANOMS system, capturing data from May 2017 through December 2017 (post-Metroplex implementation). When developing noise model tracks for the baseline screening model, the consultant team was sensitive to maintaining the initial departure headings reflected in the radar data. Baseline models must reasonably represent existing conditions, and the consultant team is confident the baseline screening model reflects existing departure patterns. 2. The proposed location of the fly-by waypoint is defined in the TARGETS procedure design. Refer to response to Comment #C-6 regarding the recommendation to use a fly-by waypoint instead of a fly-over waypoint. 3. The noise screening results did not indicate a negative noise effect in Ocean Beach, Mission Beach, or the Bird Rock area of La Jolla. The consultant team understands concerns related to the initial departure heading and recommends holding Recommendation 14 and 15 Alternative 4 from further consideration until Recommendation 17 is addressed under the Part 150 Study update process. If some CAC members prefer Recommendation 14 Alternative 1 and Recommendation 15 Alternative 2, the consultant team could present both designs to ANAC for consideration, but ANAC must choose one of the two for reasons described in the response to Comment #C-113. 4. Refer to responses to items 1 and 3, above. 5. The consultant team presented the noise screening results and recommended that proposed RNAV departure procedures be designed to meet the intent of Recommendation 14 and 15. The consultant team acknowledged in previous meetings the nighttime noise abatement heading (Recommendation 17) still needs to be addressed but that this would best be done as part of the Part 150 Study update process. Based on comments received after the March 28, 2019, meeting, the consultant team recommends holding further consideration of Recommendation 14 and 15 until Recommendation 17 is addressed. 6. Refer to response to item 5, above.
3/28/19	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 15	C-115	Various portions of the detailed elements, i.e. background/rational and procedure suggestions in ANAC #14 have not been addressed or were quickly dismissed by Ricondo, particularly the redirection of flights inside of ZZOOO and right turns over La Jolla	*The consultant team assumes the commenter is referencing ANAC Recommendation 15 because the comment was provided under a header titled "Recommendation 15."* As described in response to Comment #C-111, the consultant team reviewed the feasibility of all ANAC subcommittee suggestions for the ANAC recommendations and presented the results of the feasibility assessment at the July 19, 2018, CAC meeting. The consultant team then developed multiple procedure concepts for feasible suggestions and assessed the concepts in the three-phase traffic procedure evaluation process. The consultant team briefed CAC members of each concept and provided responses to specific comments from CAC members throughout the process. The proposed RNAV jet departure designs for Recommendation 15 Alternative 2 and 4 address the frequency of redirected flights and right turns over La Jolla. As presented at multiple CAC meetings, the routing of jets heading east and directed to make a right turn over La Jolla occurs primarily during nighttime hours. An RNAV departure procedure is not published for the routing of eastbound jet aircraft when nighttime noise abatement procedures are in effect between 10:00 p.m. and 6:30 a.m.). In some instances, ATC will direct aircraft to make a right turn instead of left. Based on discussion with FAA, a published RNAV departure procedure would reduce instances of aircraft turning right over La Jolla. A published RNAV departure procedure for eastbound departures that turns left would also reduce the frequency of radar vector operations. Based on early-turn reports published by the Authority for each ANAC meeting, the number of early-turn violations has substantially decreased since the RNAV departure procedures were implemented. The consultant team expects the same result for nighttime departures if Recommendation 15 Alternative 2 or 4 is implemented. Note that a published RNAV departure procedure will not eliminate all ATC redirected flights. Air traffic management is dynamic, and when required to maintain safe separation, an FAA air traffic controller will redirect traffic.
3/28/19	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 15 - Alternative 1	C-116	RIC Recommendation: 15 Alternative 1 (slide 27 - Daytime) – This was not offered in the final RIC Recommendations for undeclared reasons I support reconsideration of this RIC Recommendation for the following: 1. The extension of the JETTI location farther west will allow for greater separation and potentially discourage ATC from releasing aircraft off of the ZZOOO SID, which allows routes inside of ZZOOO and over Point Loma; this element was not discussed by Ricondo	The commenter may be referencing a previous version of the presentation that was shared with CAC members. The consultant team replaced this version after realizing that the recommendation for Recommendation 15 Alternative 1 was omitted. An updated version was shared with CAC members and posted to the website on March 22, 2019 (prior to the March 28, 2019, CAC meeting). The consultant team's recommendation was to move Recommendation 15 Alternative 1 forward for further consideration. 1. The consultant team briefed CAC at the March 28, 2019, CAC meeting that moving the location of JETTI farther west could reduce the frequency of ATC releasing aircraft off the ZZOOO SID, but would not eliminate the action. There are

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
					(continued) 2. The extension of the JETTI location farther west will allow for the opportunity to gain greater altitude upon transiting ZZOOO 3. The intent of ANAC #15 has not been adequately addressed by the RIC Recommendations	**(continued)** some instances when ATC redirects departures because an aircraft cannot meet the required altitude at the JORJJ waypoint (near a popular parachute jump zone). The proposed design increases flight distance, which can provide an aircraft more space to meet the altitude restriction. The design does not discourage ATC from taking necessary action to maintain safe separation and operational efficiency – the primary mission of the FAA. Therefore, use of the RNAV is assumed to be similar to use under existing conditions. An FAA air traffic controller redirects aircraft to maintain safe separation for many reasons; therefore, increasing the flight distance to JETTI would not mitigate all situations under which an FAA air traffic controller would redirect an aircraft. 2. The consultant team agrees and reported to CAC members the expectation that more aircraft on the ZZOOO SID would be at or above 8,000 feet MSL near the ZZOOO waypoint. 3. As described in response to Comment #C-111, the consultant team reviewed the intent and feasibility of all ANAC subcommittee suggestions for the ANAC recommendations and presented the results of the feasibility assessment at the July 19, 2018, CAC meeting. The consultant team then developed multiple procedure concepts for feasible suggestions and assessed the concepts in the three-phase traffic procedure evaluation process. The consultant team briefed CAC members of each concept and provided responses to specific comments from CAC members throughout the process. The consultant team was tasked to identify potential procedure concepts intended to reduce or eliminate flights over the Point Loma peninsula, and concluded the ANAC subcommittee suggestion to move JETTI waypoint two miles further west was feasible and recommended to move forward for further consideration. The design promotes more frequent flights at or above 8,000 feet MSL near the ZZOOO waypoint As discussed at the July 19, 2018 CAC meeting, the Authority and the consultant team have no legal purview to discourage FAA ATC from redirecting flights for safe separation and/or operational efficiency but can encourage FAA to use a procedure as much as possible. Discouraging FAA ATC to meet air traffic regulations and requirements to maintain a safe and efficient National Airspace System is not feasible. Limiting all aircraft between 275 and 290 can potentially affect the CNEL 65,and should be assessed under the Part 150 Study. Establishing a minimum vector area over Point Loma is not feasible because such an area is reserved for obstruction clearance requirements only.
3/28/19	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 16 - Alternative 1	C-117	RIC Recommendation: ANAC 16 Alternative 1 Version 3 (slide 36 - Daytime/Nighttime Arrivals) - Do not proceed forward due to substantial increase in noise in areas such as University City and Kearny Mesa I do not support this RIC Recommendation for the following: 1. To not proceed with any efforts offers ZERO improvements to current conditions impacting arrival communities (slide 44/45) 2. ANAC 16 Alt 1, Ver 3 offers SIGNIFICANT material improvement for LJ and Pacific Beach over recent FAA designed impacts 3. In FACT, it relocates noise BACK to where it RECENTLY was, over significant uninhabited area (NAS Miramar, Landfill), before FAA realigned STAR 4. This insufficient effort does not remotely come close to addressing ANAC #17	1. The consultant team evaluated seven different RNAV arrival procedure designs to meet the intent of Recommendation 16. Several designs were based on suggestions from the ANAC subcommittee. Five of the seven procedure designs were eliminated based on CAC feedback for not meeting the intent of Recommendation 16. One design was eliminated due to aircraft performance concerns expressed by a TAC airline representative. The one remaining design was determined to cause a noticeable increase in noise levels in some communities. In summary, the consultant team was unable to identify a feasible procedure design to meet the intent of ANAC Recommendation 16. 2. The commenter is correct regarding reductions in noise levels in areas such as La Jolla, but the alternative would result in a noticeable increase in noise levels over communities such as the University of California San Diego area, University City, and Kearny Mesa. Increasing noise in one community to decrease noise in another is not an effective noise abatement approach unless the communities that would be exposed to the increase were part of the process and had the opportunity to provide input into the decision. The consultant team does not recommend proceeding forward due to the potential increase in noise over some communities. This evaluation criterion was shared with the CAC at the beginning of this process. 3. Refer to response to Comment #C-10. 4. Recommendation 17 is related to the nighttime noise abatement heading for departures. Recommendation 16 is associated with jet arrivals from the north/northwest. A nighttime noise abatement heading for arrivals to SDIA does not exist.
3/28/19	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 13	C-118	In summary, I believe our work within the Flight Procedure Analysis Study to be significantly incomplete. Therefore, before any presentation to ANAC on RIC Recommendations, we must property assess this study's status as to ANAC Recommendations 14, 15, 16 & 17, to satisfy ANAC Recommendation #13. It is therefore also appropriate that Ricondo compile a specific summary analysis and evaluation of how and where their current RIC Recommendations: 1) positively, 2) negatively or 3) do not address the specific and detailed elements, i.e. background/rational and procedure suggestions of the unanimously SDCRAA approved ANAC Subcommittee Recommendations regarding the overall alignment of current SID's and STARs, Procedures and Agreements (ANAC Recommendation #13).	Refer to response to Comment #C-111.
3/29/19	Leonard Gross	Birdrock/ La Jolla	Rec. 14/15/17	C-125	I did the chart below last summer and it is very significant with respect to the "initial heading" of nighttime departures. It shows that the bulk of the nighttime flights are southbound and "currently" they cross MB south of the northbound flights. The Northbound are presumably on "PADRZ-like" initial course. The southern guys are on 290-like. The importance of this is far reaching: 1 Moving southern nighttime departure to be PADRZ is actually going against "current paths" for the bulk of the nighttime flights 2 Since there are so many flights doing 290 that means that 290 is already the ground track for most of the nighttime flights within 65 DNL. That is, using 290 as the initial departure for the BROCK nighttime	1. The consultant team understands that the traffic patterns for the initial headings of eastbound and northbound departures differ slightly (refer to response to Comment #C-38). When designing an RNAV procedure, FAA requires traffic operating in the same direction share a common route; therefore, the proposed procedures for Recommendation 14 and 15 nighttime departures were designed to direct aircraft on the same path. The proposed RNAV procedure designs maintains the existing PADRZ RNAV SID heading to maintain an existing RNAV initial heading path. The consultant team recommends holding the nighttime departure procedure design concepts until Recommendation 17 is addressed under the Part 150 Study.

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
					(continued) procedure is not likely to cause much of shift within 65 DNL, since the "290" nighttime flights are already in the baseline. 3 Importantly, using 290 will move some traffic further from people in MB and also increase the improvement that was seen with you current design in the PB/LJ areas. I think all this adds up to needing to "re run" the proposed nighttime departures using a different initial heading. At a minimum, it means the nighttime procedure should not be passed to the AA board until this variation is examined and/or verified as being viable with respect to the 65 DNL changes. Referenced plot chart: 	**(continued)** 2. The noise screening model was not designed to model the cumulative CNEL 65 noise exposure area; therefore, the consultant team cannot confirm the commenter's conclusion. The Part 150 Study update process will assess potential changes to the cumulative CNEL 65 noise exposure area. 3. The commenter is correct, but the proposed procedures would also move traffic closer to Ocean Beach and increase overflights over areas currently within the CNEL 65 noise exposure area and may cause newly impacted residents. Therefore, changes to initial departure headings will be assessed under the Part 150 Study update process. Based on comment received after the March 28, 2019, meeting, the consultant team recommends postponing nighttime departure final design until Recommendation 17 (nighttime noise abatement heading) is addressed under the Part 150 Study update process. Note that CAC members proposed multiple suggestions related to nighttime noise abatement headings, including the ELSO heading. If the Part 150 Study update process results in a final recommendation, the consultant team recommends incorporating the initial heading into the Recommendation 14 and 15 nighttime departure procedure designs.
3/31/19	Leonard Gross	Birdrock/ La Jolla	Rec. 14/15/17	C-126	One plot contains north/south going flights over the same period that Ricondo used for their FPA noise analysis. To show the portion "overlapped", I also generated separate N and South bound on their own plots. The last two plots are from one month in 2012 and 2014, where you see similar distribution. To be clear, the distances are along a line of longitude that passes through the tip of MB. I'd appreciate your thoughts on this and how we can speed up examination of alternative initial "headings." for nighttime departures. 	The consultant team collected radar data between May 2017 and December 2017 for use in developing the noise screening model. Refer to response to Comment #C-125 for information about the timing to evaluate nighttime noise abatement headings.
4/5/19	Mike Tarlton	Ocean Beach	Rec. 13	C-119	At the highest level, in order to be consistent with ANAC Recommendation #13, it would be great if Ricondo compiled a specific summary of how and where the RIC Recommendations positively or negatively address the ANAC Recommendations regarding the overall alignment of current SID's and STARs, Procedures and Agreements. I believe this would help us pull the thread all the way from individual recommendation to actual impact.	Refer to response to Comment #C-111.
4/5/19	Mike Tarlton	Ocean Beach	Rec. 14 Alternative 1 and 4/Rec. 15 Alternative 2 and 4	C-120	Various portions of the detailed elements, i.e. background/rational and procedure suggestions in ANAC #14 have not been addressed or were quickly dismissed by Ricondo. RIC Recommendation: 14 Alternative 1 Version 2 and 15 Alternative 2 Version 2 (slide 10 Nighttime): Was not addressed in the final RIC Recommendations for undeclared reasons RIC Recommendation ANAC 14 Alternative 4 (slide 18 Nighttime) – Proceed forward for further consideration (note: would require lifting 1.5 nautical mile early turn restriction at night) [note: highlighted by commenter] RIC Recommendation ANAC 15 Alternative 4 (slide 18 Nighttime) – Proceed forward for further consideration (note: would require lifting 1.5 nautical mile early turn restriction at night) [note: highlighted by commenter]	Refer to response to Comment #C-113.
4/5/19	Mike Tarlton	Ocean Beach	Rec 17	C-121	The Nighttime procedure proposals represented within the attached presentation have a material baseline flaw. Ricondo is using Recommendation 14 and 15 for Nighttime applications, however, these RIC Recommendations are mute on the application of Recommendation 17. The intent of Recommendation 17 was to maintain and enforce the Nighttime Noise Abatement Procedure (Letter Agreement; SCT\SAN\ATCT) that calls for a 290 departure heading for both left and right turns. The RIC Recommendation 14/15 procedure specifically calls for PADRZ (295) SID departure routing for	Refer to response to Comment #C-112.

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
					(continued) nighttime. This is in direct conflict with the intent of ANAC recommendation #17 and the Nighttime Noise Abatement Procedures (i.e. 290 degree departures). It also suggests a new but undefined waypoint that appears consistent with a 295 departure heading. The recently sent\posted "update on ANAC Recommendations" states that recommendation #17 is; "In Process; Consultant will be reviewing this in the Part 150 Study update." This is flawed reasoning\process as the existing 290 heading of the Nighttime Procedure should be maintained in this Flight Procedure Analysis process as the base line, and only changed, if deemed appropriate by the Part 150, not the reverse as proposed. Please also note that Ricondo has previously been informed of this inconsistency with Recommendation #17.	
4/5/19	Mike Tarlton	Ocean Beach	Rec. 14 Alternative 1/Rec 15 Alternative 2	C-122	I do not support these 2 (14 & 17) Recommendations for the following: 1. Flawed base line using ZZOOO and PADRZ (slide 10 clearly shows this proposed procedure aligning with WNFLD\LANDN at 295 degrees) rather than 290 Nighttime Noise Abatement Procedure (Letter Agreement; SCT\SAN\ATCT); Nighttime routing deteriorated by acceptance of PADRZ and ZZOOO departures in lieu of 290, negatively impacting OB, MB and BR (slide 16); this appears to be an attempt to eliminate the long standing 290 departure heading commitment 2. Undefined location of proposed Fly By Way Point; Fly By Way Point should be "Fly Over WP" to assure their statement of "a waypoint to provide a more predictable path" (as in the predictability of JETTI) 3. Left turns are clearly too close to shoreline at 0.5 NM; Nighttime routing deteriorated by turns allowed at 0.5 NM off shoreline versus 290 past JETTI, negatively impacting OB, MB and BR, but improvements to LJ (slide 22/23); 4. Noise comparison charts (slides 15/16) do not reflect turn closer to shoreline, do not reflect at 290 departure heading; creates a false "baseline" (at 295 vs. 290 degree headings) for noise comparisons; proposed left turns for a Fly By commencing prior to 0.5 NM from shoreline will predictably redirect jet wash noise toward Bird Rock and Mission Beach notably 1 full mile +- closer and therefore lower to shoreline, than a Fly Over WP in the same location (slide 16); 5. Validates a "new normal" for nighttime departures directed onto PADRZ, at 295 degrees 6. Memorializes the recent increased negative impact incurred by Mission Breach and Bird Rock from the ATC shift away from the Nighttime procedure to PADRZ.	Refer to response to Comment #C-114.
4/5/19	Mike Tarlton	Ocean Beach	Rec. 15	C-123	Various portions of the detailed elements, i.e. background/rational and procedure suggestions in ANAC #14 have not been addressed or were quickly dismissed by Ricondo, particularly the redirection of flights inside of ZZOOO and right turns over La Jolla	Refer to response to Comment #C-115.
4/5/19	Mike Tarlton	Ocean Beach	Rec. 15 - Alternative 1	C-124	RIC Recommendation: 15 Alternative 1 (slide 27 - Daytime): This was not offered in the final RIC Recommendations for undeclared reasons. I support reconsideration of this RIC Recommendation for the following: 1. The extension of the JETTI location farther west will allow for greater separation and potentially discourage ATC from releasing aircraft off of the ZZOOO SID, which allows routes inside of ZZOOO and over Point Loma; this element was not discussed by Ricondo 2. The extension of the JETTI location farther west will allow for the opportunity to gain greater altitude upon transiting ZZOOO	Refer to response #1 and #2 for Comment #C-116.
4/8/19	Gernot Trolf	Mission Beach	Rec. 17	C-127	As a mission Beach resident I hear a lot of complaints about the new routing by night time take offs and of course early morning take offs as well. Most people are suggesting the old route over the channel (River, 290 degrees) to reduce this noise. Can this be implemented again?	Recommendation 17 includes evaluating the nighttime noise abatement heading. CAC members offered multiple suggestions, which are expected to be evaluated under the Part 150 Study update process.
4/9/19	Leonard Gross	Birdrock/ La Jolla	Rec. 14 and 15 Nighttime Departures	C-128	How will the nighttime paths that pass directly over OB and Mission Beach be changed by the proposed post 10 PM departure procedure? This may be a boundary issue between the FPA and Part 150, but the FPA had to assume something for that part of the flight path. From the PowerPoint charts it was a bit unclear.	The RNAV designs for Recommendation 14 and 15 nighttime departures are the same as the existing PADRZ SID—aircraft stay on the runway heading until reaching 520 feet MSL, at which point aircraft proceed directly to the first waypoint. The first waypoint was placed along the expected path from Runway 27 to the WNFLD waypoint. The intent was to maintain the initial heading traffic pattern observed for the PADRZ SID because it is the only existing RNAV SID with a right turn. Based on comments received from CAC members after the March 28, 2019, meeting, the consultant team recommends postponing further consideration of the nighttime jet departure procedure designs until Recommendation 17 (nighttime noise abatement heading) is addressed under the Part 150 Study update process.
4/9/19	Leonard Gross	Birdrock/ La Jolla	Rec. 17	C-129	Right now, my data analysis (sent previously) shows that the southbound flights (290-ish degrees) are actually a bit south of the northbound flights when they pass over MB. Some fear the southbound will be directed to be on the same path (PADRZ at 293-ish degrees) as the northbound – that is, shifted north. This is not a large shift, but most likely one that MB, PB and Birdrock will "sense." The majority of nighttime flights are southbound! I know Ricondo's analysis indicated "no CNEL change" for the	The commenter would be correct if the proposed design for Recommendation 14 and 15 nighttime jet departures was implemented; however, aircraft issued the 290 heading by SDIA Air Traffic Control Tower are south of the PADRZ SID traffic. As indicated by the commenter's charts (refer to Comments #C-125 and #C-126), aircraft on the 290 heading are widely dispersed and some are located over same area as the PADRZ SID traffic. Based on comments received from CAC members after the March 28, 2019, meeting, the consultant team recommends postponing further consideration of

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM CAC MEMBER	RESPONSE
					(continued) proposed nighttime path over MB and PB, but there needs to be clarity on what path was used in the analysis, and what those areas should expect if that change was implemented.	**(continued)** proposed designs of nighttime departure procedures until Recommendation 17 (nighttime noise abatement heading) is addressed under the Part 150 Study update process.
4/10/19	Casey Schnoor	Sunset Cliffs/Fleetridge	Rec. 13	C-130	I would also like to re-suggest that Riconco provide a comprehensive status\explanation to all elements, including a response to the subtext provided by the Subcommittee (see attached) for each individual ANAC Recommendation (#14, 15, 16 and 17) currently being addressed, in advance of the ANAC presentation. I am confident that the ANAC committee will be looking for a full and comprehensive accounting at this level of detail to their unanimously supported Recommendations.	Refer to response to Comment #C-111.
4/19/19	Anthony Stiegler	Muirlands/La Jolla	Next Steps	C-131	At least some residents in La Jolla, including me as a CAC member and La Jolla's ANAC representative, Matthew Price, advocate for advancing the Flight Path & Procedures Study recommendations from Ricondo to the Airport Authority now, with a recommendation that the AA in turn advance them now to the FAA for consideration, rather than waiting for the conclusion of the Part 150 Study.	Based on comments received from CAC members after the March 28, 2019, meeting, the consultant team recommends postponing further consideration of the proposed designs of nighttime departure procedures until Recommendation 17 (nighttime noise abatement heading) is addressed under the Part 150 Study update process.
4/19/19	Anthony Stiegler	Muirlands/La Jolla	Rec. 17	C-132	We are further concerned with the Night Time Noise Abatement Agreement compliance, and the apparent failure to adhere to the 290 degree heading for night time departures. Flights departing on the PADRZ heading are at 295 degrees, which adversely affects La Jolla.	Based on comments received from CAC members after the March 28, 2019, meeting, the consultant team recommends postponing further consideration of the proposed designs of nighttime departure procedures until Recommendation 17 (nighttime noise abatement heading) is addressed under the Part 150 Study update process.

SOURCE: Ricondo & Associates, Inc. May 2019.

B.2.4 TECHNICAL ADVISORY COMMITTEE (TAC) MEETING #2 (MAY 31, 2018) INPUT AND CONSULTANT TEAM RESPONSES

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM TAC MEMBER	RESPONSE
6/12/18	Lynae Craig	Alaska Airlines	Rec. 15 Alternative 1 (Daytime)	T-1	Moving JETTI further west may not provide intended results if speed restriction is lifted and climb rate is reduced. What is the expected benefit of having aircraft at or above 8,000 ft at ZZOOO	The concept would maintain the speed restriction at JETTI, which was assigned to ensure aircraft can make the designed turn between the JETTI and ZZOOO waypoints. The intent of Recommendation 15 is to not only increase the altitude of traffic near the ZZOOO waypoint, but also to shift traffic farther west from Point Loma's shoreline to reduce noise. By increasing the altitude and distance of traffic from the shoreline, the distance between the noise source (aircraft) and receivers on the ground increases, which reduces the sound level on the ground due to noise propagation. Based on a cursory analysis using San Diego County Regional Airport Authority's (SDCRAA's) Airport Noise and Operations Management System (ANOMS) and information provided by a Community Advisory Committee (CAC) member, approximately 85 percent of aircraft on the ZZOOO Standard Instrument Departure (SID) are at or above 8,000 feet when they are near the ZZOOO waypoint. Therefore, Recommendation 15 is expected to increase the frequency of aircraft being above 8,000 feet mean sea level (MSL) when they are near the ZZOOO waypoint.
6/12/2018	Lynae Craig	Alaska Airlines	Rec. 15 Alternative 1 (Daytime)	T-2	What are the altitudes over JETTI waypoint	A cursory radar track penetration gate altitude analysis was conducted using SDCRAA's ANOMS system. Gates were drawn perpendicular to the ZZOOO SID traffic over the JETTI and ZZOOO waypoints. Between May 13 and June 13, 2018, the average altitude of Runway 27 departures on the ZZOOO SID over JETTI waypoint was 2,922 feet MSL. Approximately 65 percent of ZZOOO SID departures were between 2,000 and 3,000 feet MSL, and 30 percent between 3,000 and 4,000 feet MSL. The average altitude for Runway 27 departures on the ZZOOO SID near the ZZOOO waypoint was 9,366 ft MSL, and 85 percent of all departures on the ZZOOO SID were at or above 8,000 feet MSL.
6/14/18	Chris McCann	CAC	Rec. 14 - Equivalent Lateral Spacing Operation	T-3	Provided reference to FAA Order 7100.65X regarding 10 degree divergence for successive departures	Comment noted.
6/14/18	Chris McCann (on behalf of Gary Wannacott)	CAC	Rec. 14 - Initial Departure Heading	T-4	Inquired as to why the proposed delay the turn to the right until the aircraft is both above 520 feet and 1 mile from the end of the runway for the PADRZ SID would be relegated to the 14 CFR Part 150 Study, and the potential effect of delaying turn up to 1 mile from the end of Runway 27.	The referenced element of the Airport Noise Advisory Committee (ANAC) recommendation would change the location of the departure track over areas exposed to Community Noise Equivalent Level (CNEL) 65 or higher. As discussed during the TAC Kickoff Meeting, changes to traffic over area exposed to CNEL 65 or higher, which is the area for which noise abatement procedures have been designed, must be cumulatively assessed for noise exposure impacts. A cumulative noise assessment is not included in the Flight Procedure Evaluation effort; the assessment is conducted as part of a Title 14 Code of Federal Regulations (CFR) Part 150 Study update process (Part 150 Study update process). Evaluating the initial right turn heading for Runway 27 departures should be evaluated among other proposed initial headings, such as a 10-degree divergent heading, to assess the full potential effects on areas exposed to CNEL 65 or higher. This does not mean any proposal to change the initial right turn heading is rejected but just that it would be evaluated in a cumulative assessment of noise exposure to identify potential changes to the CNEL 65 exposure area. A minor procedure change could have a noise exposure change that would be considered significant. Final phase concept designs can be adjusted to accommodate the final initial departure heading recommendation that comes out of the Part 150 Study update process.
6/14/18	Chris McCann (on behalf of Len Gross)	CAC	Rec. 14 - Alternative 1 and 2 Nighttime	T-5	The initial heading should result in crossing Mission Beach as far south as possible, toward the unpopulated channel.	Refer to response to Comment #T-4 for discussion of changes to the initial heading from Runway 27.
6/15/18	Chris McCann (on behalf of Len Gross)	CAC	Rec. 14 - Alternative 1 and 2 Nighttime	T-6	The turn toward the "west/north-west" should be as close to the shoreline as possible, to reduce noise further up the coast line.	Recommendation 14 Night Alternatives 2 and 3 were concept designs intended to turn aircraft in a westerly direction as soon as traffic was past the CNEL 65 and higher exposure area. In both cases, the Terminal Area Route Generation and Traffic Simulation (TARGETS) flyability simulations indicated more unpredictable paths would result from the Runway 27 over area exposed to CNEL 65 or higher. The concept designs are anticipated to increase dispersion over areas not frequently overflow by Runway 27 right-turn departures. The two turn locations evaluated were close to the CNEL 65 or higher exposure area and at the shoreline. A design that turns aircraft somewhere between the shoreline and 1.5 nautical miles (NM) from the shoreline without impacting traffic patterns close to the runway may be feasible. The consultant team will design a nighttime procedure concept for Recommendations 14 and 15 that would include a westerly turn somewhere between the shoreline and 1.5 NM from the shoreline without affecting the ability to provide a predictable initial departure path from Runway 27.
6/16/18	Chris McCann (on behalf of Len Gross)	CAC	Rec. 14 - Alternative 1 and 2 Nighttime	T-7	"Conflicts" with other sub-committee recommendations need to be resolved. This should be based on "overall" reduction of noise level and/or modifying one or both of the trajectories	Recommendation 14 Night Alternative 1 - Fly Over includes a fly-over waypoint 1.5 NM from the shoreline. Recommendation 15 Night Alternative 2 includes a fly-by waypoint. To be compatible, both need to share the same type of waypoint at the 1.5 NM turning point. Because an aircraft heading to the ZZOOO waypoint and an aircraft heading to the northwest share the same initial route from Runway 27, the point where both diverge should be the same waypoint and type of operation (e.g., fly-by or fly-over). A design such as this would ensure the required separation between aircraft to support safe operations. A fly-over for Recommendation 14 Night Alternative 1 and a fly-by for Recommendation 15 Night Alternative 2 would introduce a new safety risk into the air traffic control (ATC) system because the minimum safe separation distance (i.e.,

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM TAC MEMBER	RESPONSE
						(continued) 3 NM or greater) could be compromised as the lead aircraft turns left to the south after flying over the waypoint and the following aircraft initiates an inside turn to the left to the west at the same waypoint. Introducing this new safety risk in the ATC system would not be considered feasible by the Federal Aviation Administration (FAA). A fly-by waypoint best meets the intent of Recommendation 14 and is not expected to cause aircraft currently vectored west and south of Point Loma to be at lower altitudes than those they are at today. The design for Recommendation 15 Night Alternative 2 with a fly-by waypoint would also keep aircraft farther west of Point Loma and direct aircraft to the ZZOOO waypoint, which is expected to reduce headings issued by ATC that keep aircraft south of the Noise Dots but still over the southern tip of Point Loma.
6/17/18	Chris McCann (on behalf of Len Gross)	CAC	Rec. 14 - Equivalent Lateral Spacing Operation	T-8	Proposed a concept called EMBEE with a 10 degree initial heading from Runway 27 to a waypoint called EMBEE. This would meet intent during daytime hours.	The commenter is correct that a procedure with a 10-degree divergent heading for departures turning right from Runway 27 could operate farther south compared to the existing PADRZ SID route during daytime hours. If two distinct Area Navigation (RNAV) SIDS for a single runway are defined, FAA Order 7110.65X, *Air Traffic Control*, allows for a 10-degree divergence in lieu of the required 15-degree divergent angle. The proposed concept has merit and meets the intent of Recommendation 14. The concern is that this concept would change the pattern of departure traffic over areas exposed to CNEL 65 or higher and would likely increase noise exposure for Ocean Beach residents. The consultant team will design a daytime departure procedure based on a 10-degree divergent right turn (285 degrees) from Runway 27. The route will continue along a 285-degree heading to keep traffic farther south of La Jolla. The consultant team will also design a nighttime departure procedure that will turn aircraft to a 285 heading and continue to a point 1.5 NM west of the shoreline, at which it would then turn west to stay farther south of La Jolla. The consultant team will qualitatively assess potential impacts related to the design and seek input from the TAC and the CAC about potential effects. The consultant team will be sensitive to balancing noise concerns for Ocean Beach and Mission Beach residents.
6/18/18	Chris McCann (on behalf of Len Gross)	CAC	Rec. 14 - Nighttime Noise Abatement Heading	T-9	There is no written record of the noise abatement agreement, so no one really knows what it means to abide by it. There is some consistency in people referencing a 290-degree initial heading, but no consistent specification for the vertex from which it is measured. Departures to the south are somewhat closer to the channel, and northbound departures on PADRZ are north of the channel.	The San Diego International Airport (SAN) Airport Traffic Control Tower (ATCT) has conducted the nighttime noise abatement heading for all jet departures after 10:00 p.m. for several years. Departures to the south are issued a heading by SAN ATCT when cleared for takeoff because a SID does not exist for southbound departures turning right from Runway 27. Northbound departures turn following the PADRZ RNAV SID. The difference in navigation and procedure causes slight differences in the location of aircraft overflights. Therefore, the ANAC recommended a measure to assess the Nighttime Noise Abatement heading, and the consultant team recommended that this be assessed as part of the Part 150 Study update process because it has the potential to change the CNEL 65 or higher exposure area.
6/18/18	Chris McCann (on behalf of Len Gross)	CAC	Rec. 14 - Nighttime Noise Abatement Heading	T-10	Should be talking about RNAV procedures and deviations from them, not conformance to an old and poorly defined agreement. In the near-term, no significant weight should be put on consistency with the noise dots or noise abatement agreement. Instead, the best possible solution consistent with the real problem constraints should be generated.	The consultant team is evaluating procedure design concepts in accordance with ANAC recommendations. The ANAC recommended that the consultant team consider the Noise Dot Agreement as a factor in this evaluation, but the Noise Dot Agreement should not limit the identification and review of concepts that turn aircraft prior to 1.5 NM from the shoreline if the concepts meet ANAC recommendations.
6/13/18	Chris Bear & John McFerren	SkyWest Airlines	Rec. 14 - Alternative 1 Nighttime	T-11	Provides flight crews ample time to fly a steady course after takeoff.	Comment noted.
6/13/18	Chris Bear & John McFerren	SkyWest Airlines	Rec. 14 - Alternative 2 Nighttime	T-12	Seems to have low impact to flight path distance and operationally provides more distance between the shoreline turn and Brock2 waypoint. In our opinion, this option seems to be the best of the 3.	Refer to response to Comment #T-6.
6/13/18	Chris Bear & John McFerren	SkyWest Airlines	Rec. 14 - Alternative 3 Nighttime	T-13	Creating a waypoint this close to the initial departure flight path with a proceeding VA to DF coding is not advised. This could create some navigational anomalies within some flight management systems. An example of a common anomaly is the navigation computer (FMS) sequencing late and conducting a 360 degree turn back around to pass over this close-in waypoint.	Refer to response to Comment #T-6.
6/13/18	Chris Bear & John McFerren	SkyWest Airlines	Recommendation 15 - Alternative 1 Dayttime	T-14	Without a set speed for aircraft to follow till ZZOOO, the turn radius and flight tracks will be variable.	The consultant team will maintain the current ZZOOO SID 230 knots speed restriction in the concept design up to the JETTI waypoint. The speed restriction was set to ensure aircraft can make the turn from JETTI to the ZZOOO waypoint. The consultant team expects some dispersion as aircraft move between JETTI and ZZOOO similar to that which occurs for traffic using the current ZZOOO SID. The dispersion is expected to be acceptable as long as aircraft are farther west of Point Loma compared to existing conditions.
6/13/18	Chris Bear & John McFerren	SkyWest Airlines	Recommendation 15 - Alternative 2 Nighttime	T-15	This option provides a more consistent flight path track.	The commenter is correct regarding a consistent flight path due to the track-to-fix design.
6/13/18	Chris Bear & John McFerren	SkyWest Airlines	Rec. 15 - Alternative 3 Nighttime	T-16	Without a set speed for aircraft to follow till ZZOOO, the turn radius and flight tracks will be variable.	Because this alternative includes a fly-over waypoint 1.5 NM from the shoreline, a direct-to-fix design is included, similar to the existing ZZOOO SID. The commenter is correct related to dispersion, but the point where traffic disperses is expected to be farther west of Point Loma compared to where existing ZZOOO SID traffic disperses. If the design concept moves forward, the consultant team will assess the need for a speed restriction to make the turn feasible between the proposed fly-over waypoint and the ZZOOO waypoint.

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM TAC MEMBER	RESPONSE
6/13/18	Chris Bear & John McFerren	SkyWest Airlines	Rec.16 - Alternative 1	T-17	KLOMN at 6000 feet is already difficult to make for the navigation software. Steep descents are not recommended with speed reductions in arrival procedures. This combination could lead some navigation software to reduce speed well before air traffic control would like the aircraft to be at a slower speed.	The concept design meets standard descent gradient criteria, but the consultant team understands potential issues related to reducing speed while descending, especially for newer aircraft with high lift ratio wings. The consultant team will seek further input from airline TAC members related to the descent design for Alternative 1.
6/13/18	Chris Bear & John McFerren	SkyWest Airlines	Rec. 16 - Alternative 2	T-18	KLOMN at 6000 feet is already difficult to make for the navigation software. Steep descents are not recommended with speed reductions in arrival procedures. This combination could lead some navigation software to reduce speed well before air traffic control would like the aircraft to be at a slower speed.	The consultant team recommends elimination of Alternatives 2 and 3 from further evaluation based on CAC input.
6/13/18	Chris Bear & John McFerren	SkyWest Airlines	Rec. 16 - Alternative 3	T-19	KLOMN at 6000 feet is already difficult to make for the navigation software. Steep descents are not recommended with speed reductions in arrival procedures. This combination could lead some navigation software to reduce speed well before air traffic control would like the aircraft to be at a slower speed.	Refer to response to Comment #T-18
6/14/18	Debbie Watkins	ANAC	Rec. 14 - Nighttime Noise Abatement Heading	T-20	Purposes of this process is to look at the feasibility of the Nighttime Noise Abatement Procedure that was implemented in the late 1990's to mitigated airplane noise over the Point Loma community as part of their community plan update by moving all departing nighttime flights over the Mission Beach community. Discussion needs to be had to determine whether this procedure is meant to be followed into perpetuity with modifications or eliminated	The Nighttime Noise Abatement heading is expected to be evaluated as part of the Part 150 Study update process, as discussed during the TAC Kick-off Meeting. Changing the location or use of the existing traffic pattern may affect the area exposed to CNEL 65 or higher, and TAC members may propose multiple concepts to address noise concerns. The Part 150 Study update is the appropriate process to assess potential benefits and impacts of procedure changes on the area exposed to CNEL 65 or higher.
6/14/18	Debbie Watkins	ANAC	Rec. 14 - Alternative 1 Nighttime	T-21	This does not help mitigate the nighttime noise over Mission Beach.	The proposed design for Recommendation 14, Alternative 1 (Nighttime) maintains the existing initial departure heading to ensure overflight patterns do not change over areas exposed to CNEL 65 or higher. A change to the initial departure heading is expected to be evaluated as part of the Part 150 Study update process as discussed during the TAC Kick-off Meeting. Refer to response to Comment #T-4.
6/14/18	Debbie Watkins	ANAC	Rec. 14 - Alternative 3 Nighttime	T-22	This does not help mitigate the nighttime noise over Mission Beach.	Refer to response to Comment #T-6.
6/14/18	Debbie Watkins	ANAC	Rec. 15 - Alternative 1 Dayttime	T-23	Can this design be considered as nighttime departure procedure over Point Loma?	The commenter appears to suggest two nighttime departure headings: 275 and a preferred right-turn heading. This proposal would reduce the number of flights that make a right turn and operate near/over Mission Beach at night. Because this would have a direct effect on areas exposed to CNEL 65 and higher, the consultant team recommends this proposal be assessed as part of the Part 150 Study update process and be considered as an alternative measure under the Nighttime Noise Abatement heading recommendation.
6/14/18	Debbie Watkins	ANAC	Rec. 15 - Alternative 2 Nighttime	T-24	This does not help mitigate the nighttime noise over Mission Beach.	The proposed design for Recommendation 15, Alternative 2 (Nighttime), maintains the existing initial departure heading to maintain existing overflight patterns over areas exposed to CNEL 65 or higher. A change to the initial departure heading would be evaluated as part of the Part 150 Study update process as discussed during the TAC Kick-off Meeting. Refer to response to Comment #T-4.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec.14 - Alternative 2 Nighttime	T-25	Not consistent with nighttime noise abatement heading.	Refer to response to Comment #T-6 related to Recommendation, 14 Alternative 2 (Nighttime). The commenter is referencing the 290 heading from Runway 27 as the nighttime noise abatement heading. Refer to response to Comment #T-4 related to initial departure heading assessment.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 14 - Fly Over Waypoint	T-26	Recommendation 14 inclusion of a "fly over" waypoint not addressed.	The consultant team addressed the use of a fly-over waypoint for Recommendation 14, Alternative 1, at 1.5 NM from the shoreline and included the procedure design in the CAC Meeting #2 presentation for consideration. The consultant team's recommendation is to proceed with a nighttime departure procedure design that uses a fly-by waypoint where aircraft change heading in a westerly direction to stay farther south of La Jolla. A fly-over waypoint would cause a more unpredictable turning path north of the waypoint and would place traffic closer to La Jolla shoreline compared to a fly-by waypoint design. The draft procedure design will also keep traffic from turning until 1.5 NM from the shoreline by defining the turn to a westerly direction based on estimates of where aircraft are anticipated to begin the turn.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 14 - Initial Review	T-27	"The magnetic heading from the departure end of Runway 27 is 287°" does not make sense.	The statement in quotes, from a TAC Meeting #2 slide, is related to the magnetic heading from the end of Runway 27 to the current Noise Dot #2. The statement was intended to clarify that an initial heading to Noise Dot #2 would not meet the 15-degree divergent angle from 275 degrees. The consultant team understands the commenter is referencing an ANAC Subcommittee suggestion to move Noise Dot #1 to location 1.5 NM west of the shoreline on a 290-degree magnetic heading from the departure end of Runway 27. A fly-over waypoint would be placed in the procedure design at that point. The consultant team is concerned that changes in the suggested design's flight patterns over the CNEL 65 and higher exposure area would result in a noise effect. Refer to response to Comment #T-4 related to initial departure heading changes.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 14 - Daytime	T-28	Moving LNDN and WNFLD south in line with 290 heading from Runway 27 would provide the required 15 degree divergence.	A 290-degree heading from the departure end of Runway 27 would provide a 15-degree divergent angle from the 275 heading. The effect on the location of the LNDN and WNFLD waypoints would depend on the initial heading design for an

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM TAC MEMBER	RESPONSE
						(continued) RNAV procedure. The consultant team is concerned that changes in the suggested design's flight patterns over the CNEL 65 or higher exposure area would result in a noise effect. Refer to response to Comment #T-4 related to initial departure heading changes.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 14 - Daytime	T-29	Move BORDER SID further south in order to accommodate earlier turn towards a more westerly heading for PADRZ SID departures to maintain 3 mile separation.	Moving the BORDER SID south is not feasible because it would not address the 3-NM separation requirement between aircraft on the PADRZ and ZZOOO SIDs. If the BORDER SID is moved south, traffic on the PADRZ SID would still need to maintain a 3-NM separation from traffic over the JETTI waypoint. If the JETTI waypoint is moved farther west (per Recommendation 15, Alternative 1), the 3-NM separation from the PADRZ SID would be still be required. In addition, it is anticipated that the FAA would require that the ZZOOO SID be similar to the proposed change to the BORDER SID to provide a consistent path between the two procedures in order to (1) reduce the complexity of managing traffic, and (2) maintain the ability for visual separation between aircraft on the procedures.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 15 - Night Alt 3	T-30	Prefer "fly over" waypoint design.	Refer to response to comment #T-7.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 16	T-31	Inquired about timing of Class B airspace change.	At the time this response was drafted, the FAA Southern California TRACON (SCT) is not certain when the Class B changes will be implemented. All the necessary work is complete, and documentation has been submitted to FAA Headquarters.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 16	T-32	Existing flights over I-805 and SR-52	The commenter suggests that because flights are currently directed over the I-805/SR-52 intersection, potential changes in aircraft noise exposure should not be a factor that contributes to the elimination of Recommendation 16, Alternative 1. ATC does direct aircraft over the intersection of I-805 and SR-52, but this occurs less frequently than assigning aircraft the COMIX Standard Terminal Arrival (STAR) procedure. Therefore, the change in use between directing aircraft over the intersection and the COMIX STAR would affect noise exposure. Under the SoCal Metroplex, the COMIX STAR flight track was shifted 1,200 feet south over the La Jolla area but the altitude as aircraft crossed the shoreline increased. In a study conducted by BridgeNet International, (https://bit.ly/2DhDD6i starting on Page 22) it was determined that the "…changes were not in themselves sufficient to result in measurable changes in noise." Furthermore, analysis of 18 years of historic data (SDCRAA's ANOMS) shows that, historically, aircraft were dispersed over the La Jolla neighborhoods. When the FAA implemented the first RNAV (satellite-based) procedure (BAYVU 1), the flight corridor became increasingly concentrated. The images below show 2 days of SDIA arrivals by year.  Source: Radar tracks based on the San Diego County Regional Airport Authority's Airport Noise and Operations Monitoring System (ANOMS), accessed September 2018. The FAA is required to evaluate procedural changes pursuant to the National Environmental Policy Act (NEPA) to determine if a proposed procedure would cause significant environmental impacts, as well as reportable changes. This evaluation compares a No Action condition to a Proposed Action condition, as required in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. The evaluation includes assessment of future year (the year in which the proposed procedural change would be implemented) forecast operations following existing traffic patterns and usage rates in place at the time the NEPA assessment was started and compares it to the forecast operations activity following the proposed procedural changes to identify the change in aircraft noise exposure on communities. Because the justification for a proposed procedure would be to reduce community noise exposure, it is unlikely that FAA would approve a procedure that shifts noise exposure from one community to another based on the comparison between No Action (existing traffic patterns) and the Proposed Action (proposed procedure change). The consultant team will proceed forward with Recommendation 16, Alternative 1 design. If the concept proceeds forward to Phase 3, the consultant team will model potential changes in CNEL rather than relying upon FAA's screening methodology.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 16	T-33	Historically arrivals were north of Alternatives 1, 2 and 3 pre-NextGen and allowed for higher altitudes over Miramar.	As discussed in the response to Comment #T-32, the assessment of noise impacts pursuant to NEPA compares the traffic patterns expected to be in use in a future year to traffic patterns with the proposed procedural change in place. Historical traffic patterns, that have since changed, are not evaluated in the assessment of noise impacts under NEPA.

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM TAC MEMBER	RESPONSE
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 16	T-34	Inquired on what the maximum altitude arrivals can be at LNTRN waypoint while meeting the 330' descent rate criteria.	Based on additional review, aircraft crossing over LNTRN at 10,000 feet MSL under Alternative 1 can meet design criteria. The consultant team will require input from airlines and FAA to confirm. Airlines expressed concerns about the ability under the initial design to safely descend and slow down at the same time.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 16 - Alt 1	T-35	Recommends moving forward with Alternative 1 design.	Comment noted.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 16 - Alt 2	T-36	Inquired why aircraft could not be at 10,000 feet above LNTRN assuming 330' descent rate and get to KLOMMN at 6,000 feet. It appears based on distance between the two points and the descent rate, aircraft could do it.	Refer to response to Comment #T-18.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 16 - Alt 2	T-37	Prefers Recommendation 16 Alt 1 with a maximum at or above altitude over LNTRN waypoint and along the path after LNTRN.	Refer to response to Comment #T-18.
6/15/18	Melissa Hernholm (on behalf of Casey Schnoor)	CAC	Rec. 16 - Alt 3	T-38	Concept does not meet intent of recommendation, lowers minimum altitude when crossing the shoreline, and has worse impact on La Jolla.	Refer to response to Comment #T-18.

SOURCE: Ricondo & Associates, Inc., October 2018.

B.2.5 TECHNICAL ADVISORY COMMITTEE (TAC) MEETING #3 (AUGUST 30, 2018) INPUT AND CONSULTANT TEAM RESPONSES

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM TAC MEMBER	RESPONSE
9/13/18	Debbie Watkins	ANAC	Rec. 14	T-39	I agree with consultants to eliminate the proposed designs discussed in the presentation and proceed with noise modeling: ANAC Noise Recommendation 14 - Alternatives ▪ Alternative 1 - Fly by Turn ▪ Alternatives 4 (not good for Mission Beach); 5 & 6 (benefits Mission Beach but moves noise further south closer to OB) -still want noise analysis on these 3 new designs	The consultant team will proceed forward with noise modeling Recommendation 14—Alternative 1 Fly By Turn at 1.5 NM and Alternative 4 Turn between Shoreline and 1.5 NM. Alternatives 5 and 6 are related to the 285-degree heading (or Equivalent Lateral Spacing Operations [ELSO]). The consultant team recommends advancing the 285-degree initial departure heading from Runway 27, Recommendation 17, Compliance to the Nighttime Noise Abatement Agreement, and other input provided by CAC members related to the initial departure heading from Runway 27 (presented on Slide 18 of the TAC Meeting #3 presentation) to the Part 150 Study update process given the potential for these changes to affect the area exposed to CNEL 65 or higher. Refer to response to Comment #T-4.
9/13/18	Debbie Watkins	ANAC	Rec. 15	T-40	I agree with consultants to eliminate the proposed designs discussed in the presentation and proceed with noise modeling: ANAC Noise Recommendation 15 - Alternatives - Proceed with noise modeling ▪ Alternative 1 ▪ Alternative 2 ▪ Alternative 4 & 5	The consultant team will proceed with noise modeling of Recommendation 15, Alternative 1 (Move JETTI waypoint 2 NM West), Alternative 2 (turn at fly-by waypoint at 1.5 NM), and Alternative 4 (Turn between Shoreline and 1.5 NM). Alternative 5 is related to the 285-degree heading (or ELSO). Refer to response to Comment #T-4 related to the 285-heading and other initial heading concepts.
9/13/18	Debbie Watkins	ANAC	Rec. 16	T-41	ANAC Recommendation 16 -- no comments.	Comment noted.
9/14/18	Christopher Bear	SkyWest	Rec. 16	T-42	As we talked about during the ongoing discussions we would always prefer routing and profiles that reduce airtime and thus fuel burn requirements. The same holds true for lower altitudes so that a stabilized yet shorter approach can be had.	The consultant team is evaluating a potential design revision to lower altitudes in Alternative 1. Based on input provided by the TAC airline representatives, the current design for Alternative 1 is not feasible due to safety and increased workload for pilots/controllers.
9/14/18	Christopher Bear	SkyWest	Rec. 14 and 15	T-43	As far as departure corridors we are not as concerned since the variances regarding proposed and current are so minor. With regard to requirements for maintaining track alignment on departure; we do that anyway since RNAV is so precise and the flight director guidance is being flown by our pilots at all times unless being vectored.	Comment noted.
9/18/18	Lynae Craig	Alaska Airlines	Rec.16	T-44	I did get some feedback on the proposed change to the COMIX RNAV STAR and responses to the questions below. 1. Changing the ground track between LNTRN and KLOMN appears to be in direct conflict with Miramar airspace. (north of the MZB 084 degree radial) 2. The existing tracks on the Recommendation 16 Alternative 1 map show the majority of flights precisely follow the published STAR, with some following the direct path as recommended. Those that went direct would have been at times the controller saw there wouldn't be a conflict and allowed it. It's an exception, not a normal use of that airspace. 3. Changing the speed at LNTRN to 200kts would require the aircraft to be dirty (flaps out) for an additional 16 miles. That's not something that airlines would be able to support, and likely not meet the community's goal of quieter flights. 4. KLOMN is the IAF for the public and special RNP approaches. Changing the location or altitude of that waypoint would negatively impact the RNP approaches. 5. Reducing the at or above 9000 ft. altitude at LNTRN to at or above 8000 ft on the existing COMIX STAR/path, would be acceptable from the pilot perspective, but unsure how that would impact ATC.	The following are responses to each item provided by the commenter: 1. The consultant team coordinated with SCT prior to TAC Meeting #3. FAA did not indicate a direct conflict with Miramar airspace. FAA indicated potential need to adjust sectors and/or standard operating procedures, but they cannot provide a full assessment until the proposed concept is submitted for consideration under the PBN Implementation process. 2. The consultant team understands that flights not on the COMIX RNAV STAR are directed by SCT via headings, airspeed, and/or altitude; the flights are provided direction when there is no conflicting traffic. Refer to response to Comment #T-32. 3. Comment noted. 4. The consultant team concurs with the commenter, which is why all proposed designs for Recommendation 16 do not change the location or altitude of the KLOMN waypoint. 5. The consultant team is evaluating a design concept that would lower altitude at LNTRN to 8,000 feet MSL, but then goes direct to the I805/SR52 intersection and then to the KLOMN waypoint. SCT did not indicate high-level concerns as long as the COMIX waypoint remains at the same location with aircraft above 12,000 feet MSL at COMIX waypoint, and the LEJEN waypoint location and altitudes remain the same. SCT could not provide any additional specifics until a concept is formally submitted for review.

SOURCE: Ricondo & Associates, Inc. October 2018.

B.2.6 TECHNICAL ADVISORY COMMITTEE (TAC) MEETING #5 (MARCH 28, 2019) INPUT AND CONSULTANT TEAM RESPONSES

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM TAC MEMBER	RESPONSE
4/19/19	Debbie Watkins	ANAC	Rec. 14 Alternative 4 and Rec.15 Alternative 4	T-45	There are 2 recommendations of concern to us in Mission Beach. ANAC 14 Alternative 4 and ANAC 15 Alternative 4. They both propose to move the nighttime departure flight paths over the jetty area of Mission Beach from the 290-degree nighttime departure heading, which has been implemented since the 1990's, to the new Next-Gen PADRZ waypoint. One recommendation would have planes change course at 1.5 NM west of the shoreline and one would change course .5 NM west of the shoreline. The purpose would be to reduce aircraft noise over La Jolla. However, the noise modeling analysis for these 2 proposed recommendations shows that the noise will increase over Mission Beach by 1 decibel. I question whether the actual decibel level is actually higher but for this purpose, any increase over an already noise-impacted community is one of the metrics used by the FAA in determining whether to make flight path procedure changes. An important objective for me regarding aircraft noise and the Nighttime Departure "Procedure" over the years is to **reduce** the aircraft noise and **not increase** the noise in the Mission Beach community, even 1 db. As you know, the Mission Beach community is impacted by aircraft noise from 6:30 AM to 11:30 PM. All nighttime departures from 10 PM – 11:30 PM are already directed over the Mission Beach community. Any increase in operations at the airport, increases the aircraft noise Mission Beach receives every day and night. I plan to vote to **not** recommend sending these two recommendations to the Airport Authority because aircraft noise would increased over an already noise impacted community. New flight procedures will be reviewed under the Part 150 study, including the Nighttime Noise Abatement Procedure. Perhaps it is time to consider another flight procedure for nighttime departures along with the current Nighttime Noise Abatement Procedure so Mission Beach does not continue to receive the brunt of all departing flights from 10 – 11:30 PM. We can call it **SLEPN** – short for Sleeping.	Based on comments received from CAC members after the March 28, 2019, meeting, the consultant team recommends postponing further consideration of the proposed designs of nighttime departure procedures until Recommendation 17 (nighttime noise abatement heading) is addressed under the Part 150 Study update process.

SOURCE: Ricondo & Associates, Inc. May 2019.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C

Review and Analysis of Airport Noise Advisory Committee Recommendations 18, 19, and 20

March 2019

San Diego International Airport

Review and Analysis of:

Airport Noise Advisory Committee Recommendations 18, 19, and 20

Prepared for:

San Diego County Regional Airport Authority

Prepared by:

RICONDO

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF EXHIBITS

1. SUMMARY OF FINDINGS

This report documents Ricondo & Associates, Inc. (Ricondo) findings and recommendations related to the San Diego International Airport (SDIA) Airport Noise Advisory Committee (ANAC) Recommendations 18, 19, and 20.

A summary of the findings for the three ANAC recommendations are as follows:

- ANAC Noise Recommendation 18, Independent Definition of an Early Turn – Based on research conducted, Ricondo defines an "early turn" as follows: Runway 27 jet departures or missed approaches that are vectored off an initial departure heading prior to 1.5 nautical miles west of the shoreline or those aircraft routed back (south and east bound) over residential areas of Point Loma north of Fort Rosecrans National Cemetery, with the exception of aircraft vectored off course to ensure safe separation. Ricondo recommends the adoption of this definition as a baseline for the future and is consistent with Federal Aviation Administration's (FAA) standard operating procedures. The San Diego County Regional Airport Authority (Authority) definition is consistent with Ricondo's recommended definition, but should add missed approaches to confirm missed approaches stay on FAA air traffic controller assigned initial heading until 1.5 nautical miles west of the shoreline. The FAA is the only entity capable of identifying whether an early turn was initiated for separation purposes or not. The Authority should continue to presume all early turns measured are non-compliant unless Authority staff obtains fact-based evidence of separation requirements (e.g. to avoid adverse weather along the departure path, separate from arrivals to Runway 9, air traffic controller/pilot communication indicating need to divert) and/or FAA can confirm an early turn was necessary to maintain safe separation.
- ANAC Noise Recommendation 19, Modification of Standard Instrument Departure (SID) Flight Procedures to Mitigate Early Turns – The intent of this recommendation is met by the design of the existing SID procedures and is duplicative of Recommendations 14 and 15; therefore, Ricondo recommends not to advance this recommendation forward as a separate concept.
- ANAC Noise Recommendation 20, Incorporation of Noise Dots into Flight Procedures – Incorporating noise dots as waypoints in existing or proposed SIDs is not feasible. The current Area Navigation (RNAV) departures comply with the early-turn restrictions. The focus should be to work with FAA on keeping aircraft on the RNAV departure procedures. An alternative concept to move Noise Dots #3 and #4 south of Point Loma was considered, but most likely will not be feasible based on preliminary feedback from FAA.

2. AIRPORT NOISE ADVISORTY COMMITTEE RECOMMENDATION 18

2.1 INDEPENDENT DEFINITION OF AN EARLY TURN

The specific goals of ANAC Noise Recommendation 18 was to review the current definition of an early turn, define what an early turn means, and conduct comparative analyses of actual flight paths if the definition is found to vary from the one applied by the Authority.

Ricondo's assessment was based on discussions with Authority staff, and source material provided by the Authority and FAA including:

- San Diego County Regional Airport Authority Board (Authority Board) Staff Report, Item #12, "Status Update and Possible Action on Community Noise Issues on Noise Dots," April 21, 2016 (April 2016 Authority Staff Report) and Attachments

  https://san.org/DesktopModules/Bring2mind/DMX/Download.aspx?EntryId=8661&Command=Core_Download&language=en-US&PortalId=0&TabId=341

  - Attachment 1: Correspondence from Representative Brian Bilbray on October 28, 1998 (Rep. Bilbray letter)
  - Attachment 2: California State Auditor report titled, San Diego International Airport at Lindbergh Field, Local Government, Including the San Diego Unified Port District, Can Improve Efforts to Reduce the Noise Impact Area and Address Public Dissatisfaction (California State Auditor Report)
- Historical Southern California Terminal Radar Approach Control (SCT) 2007, 2009, 2012, and 2017 radar video maps (radar video maps)
- Noise dot latitudes and longitudes provided via email correspondence from Authority staff, FAA staff, and community members in 2005 and 2016 (refer to **Appendix A** for email correspondence)
- Noise dot coordinate information from the Authority's Airport Noise and Operations Monitoring System (ANOMS) (refer to Appendix A for email correspondence)
- Mr. Paul Grimes comment letter to the FAA Western Service Center, Operations Support Group, on the *SoCal Metroplex Draft Environmental Assessment, September 25, 2015* (Mr. Grimes letter) (refer to Appendix A for a copy of the letter)
- Review of the FAA Order 7110.65B, *Southern California Terminal Radar Control Standard Operating Procedures,* March 29, 2018 (2018 SCT SOP)[1]
- Review of the Southern California Terminal Radar Approach Control and Lindbergh Airport Traffic Control Tower Letter of Agreement, June 27, 2017 (SCT-SAN ATCT LOA)[2]
- February 2019 ANAC Agenda Package, "Early-Turn Statistics" [3] (February 2019 ANAC Agenda Package)

The source materials listed above were the best available at the time this analysis was conducted. A summary of the information considered from each source, along with a citation for each source, is provided in **Appendix B**.

2.1.1 THE AUTHORITY'S DEFINITION OF AN EARLY TURN

The concept of an early turn began following efforts of Representative Brian Bilbray, the FAA, and Point Loma community members to reduce aircraft noise exposure in residential areas of Point Loma in October 1998. As a result of these efforts, FAA added dots to the SCT Air Traffic Control (ATC) radar screens as visual references to assist

[1] FAA Order 7110.65B - Southern California Terminal Radar Control Standard Operating Procedures, March 29, 2018 (Confidential document made available for Ricondo & Associates, Inc. review by the Federal Aviation Administration).

[2] Southern California Terminal Radar Approach Control and Lindbergh Airport Traffic Control Tower Letter of Agreement, June 27, 2017 (Confidential document made available for Ricondo & Associates, Inc. review by the Federal Aviation Administration).

[3] San Diego County Regional Airport Authority, Airport Noise Advisory Committee Agenda, "Item 2.c: Early-Turn Statistics," December 19, 2018 (Page 5).
https://www.san.org/DesktopModules/Bring2mind/DMX/Download.aspx?EntryId=12501&Command=Core_Download&language=en-US&PortalId=0&TabId=487.

controllers with vectoring aircraft out and south of the residential areas of Point Loma. Although there is no formal agreement in place, this initiative is commonly referred to as the "FAA Noise Dot Agreement."

Based on discussions with Authority staff, review of several references found in the April 2016 Authority Staff Report, and review of the February 2019 ANAC Agenda Package, early turns for Runway 27 are currently defined by the Authority as follows:

- jet aircraft departures turning to the right 300 feet or more prior to Noise Dot 1 located 1.5 nautical miles (NM) from the shoreline on a 295-degree heading;
- jet aircraft departures turning to the left 300 feet or more prior to Noise Dot 3 located 1.5 NM from the shoreline on a 265-degree heading; and/or
- jet aircraft departures that turn south or east over the residential areas of the Point Loma peninsula 300 feet or more north of Noise Dots 4 and 5.

For illustrative purposes only, **Exhibit 1** depicts the location of the current noise dots and areas considered to define early turns. The lines from Runway 9-27 to Noise Dot 1 and to Noise Dot 3 were designed to define an area wide enough to account for potential course drift as jet aircraft proceed on an assigned initial heading. The lines start prior to the departure end of Runway 27 to account for aircraft that lift-off and climb to an altitude that allows for an initial heading turn prior to reaching the departure end of Runway 27. The Authority relies on ANOMS to tag flight tracks that enter into the early turn areas prior to reaching 1.5 NM west of the shoreline. Next, Authority staff visually review all the potential early turns identified in ANOMS to confirm each track captured was an early turn.

2.1.2 INDEPENDENT DEFINITION OF AN EARLY TURN

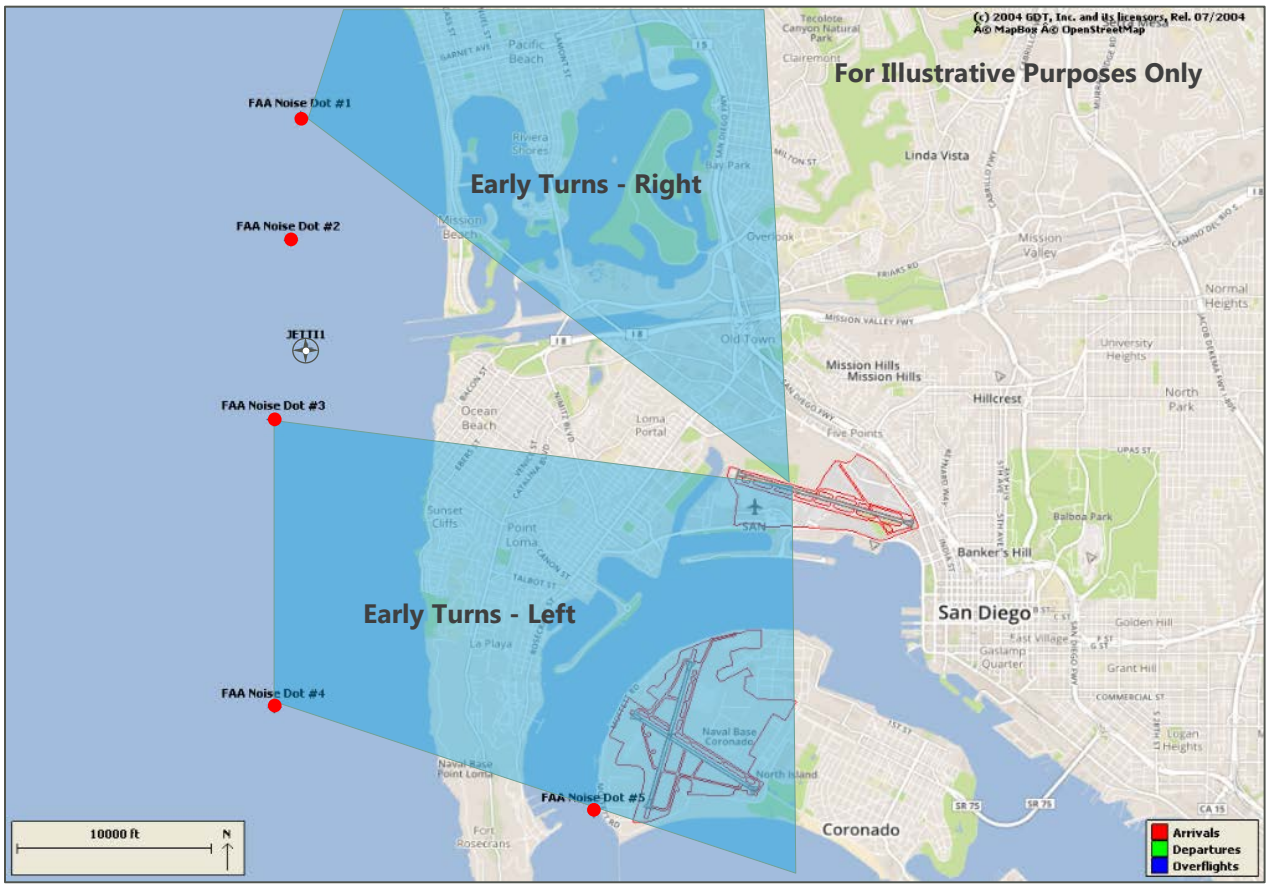
Ricondo reviewed the information provided and found no evidence of a formal agreement in place between the FAA and any other party related to early turns. The radar video maps and the restrictions listed in the 2018 SCT SOP are the only documented actions taken by the FAA pertaining to the use of the noise dots and restricting turns after an initial departure heading from Runway 27 until 1.5 NM west of the shoreline. These actions were taken as a result of the efforts identified in the Rep. Bilbray letter. Through the years, noise dots have been added and their locations have been changed by the FAA for operational feasibility reasons and through collaborative efforts between the Authority and FAA. However, the restrictions in the 2018 SCT SOP have remained the same since at least 2003, which was the earliest SCT SOP made available to Ricondo for review.

The definition of an early turn should be predicated on the procedures that are documented and in use. Based on all the information reviewed, Ricondo definition of an early turn as follows:

> *Runway 27 jet departures or missed approaches that are vectored off the initial route prior to 1.5 nautical miles west of the shoreline or those aircraft routed back (south and east bound) over residential areas of Point Loma north of Fort Rosecrans National Cemetery, with the exception of aircraft vectored off course to ensure safe separation.*

An important note regarding the recommended early turn definition is no mention of noise dots. The primary intent of the routing is to keep jet aircraft on an initial heading from Runway 27 until they are 1.5 NM west of the shoreline. The noise dots on the SCT radar video map serve as visual reference for air traffic controllers when they are guiding aircraft using radar vectors. The routes defined for each current RNAV SID are designed to meet the requirements; therefore, the noise dots are no longer needed as reference if an aircraft is flying an RNAV SID. As the frequency of SID use increases, the role of the noise dots becomes less relevant as more aircraft are assigned the RNAV SIDs.

EXHIBIT 1 AUTHORITY EARLY TURN DEFINITION GRAPHIC



SOURCE: San Diego County Regional Airport Authority, March 12, 2019.

A comparison between the 2017 radar video map and the ANOMS noise dot location data indicate a slight difference in the location of Noise Dot 3 (refer to the ANOMS discussion in Attachment A). Because SCT controllers still rely on radar vectors, Ricondo recommends that the Authority coordinate with SCT to resolve differences in interpreting the location of Noise Dot 3. SCT controllers use the radar video map noise dots as a visual reference when they need to radar vector a departure for safe separation purposes or an RNAV SID is not available (e.g. eastbound departures on nighttime noise abatement heading between 10:00 p.m. and 6:30 a.m.). The Authority's compliance assessment should be based on the same points used by SCT controllers.

2.1.3 COMPARATIVE ANALYSIS

The Authority's definition of an early turn is very similar to Ricondo's. The only difference is the Authority's definition includes a 265-degree magnetic heading to the south and a 295-degree magnetic heading to the north and is silent on reasons for early turns to maintain safe separation. Both magnetic headings are defined from a point prior to the departure end of Runway 27. The 265-degree magnetic heading defines a line to Noise Dot 3, and the 295-degree magnetic heading defines a line to Noise Dot 1. According to Authority staff, the area was designed wide enough to account for potential course drift along the assigned initial headings for jet aircraft. The Authority uses the two lines in ANOMS to define an area to filter for jet aircraft that go through the lines prior to reaching the noise dots. Jet aircraft that do not cross through the lines are considered to be on the assigned initial heading. The area also captures turns required for safe separation. SCT is the only entity capable of identifying whether an early turn

was initiated for safe separation purposes. The Authority presumes all early turns measured are non-compliant unless SCT can confirm otherwise. Ricondo recommends the Authority continue to presume all early turns as non-compliant unless the Authority obtains fact-based evidence of non-compliance to maintain safe separation (e.g., severe weather avoidance, separation from Runway 9 arrivals and air traffic control frequency recordings indicating air traffic controller or pilot request to turn for safe separation) or FAA provided information indicating an early turn was necessary for safe separation. **Table 1** provides a summary of the early turns recorded since 2013.

TABLE 1 EARLY TURNS AS CALCULATED BY THE AUTHORITY

YEAR	OPERATIONS [1]
2013	829
2014	1,105
2015	1,293
2016	776
2017	420
2018	269
2019	37[2]

NOTES:
1 Includes operations at all altitudes.
2 Through January 31, 2019.
SOURCE: San Diego County Regional Airport Authority, Airport Noise Advisory Committee Meeting Agenda Package, "Early-Turn Statistics," February 20, 2019.

SCT does not identify specific initial departure headings as part of the early turn restriction, but it expects jet aircraft to be on standard initial headings issued by SAN ATCT documented in the SCT-SAN ATCT LOA or SID procedures. The area defined by the 265-degree and 295-degree lines includes the standard initial departure headings SAN ATCT can assign to jet aircraft or are defined in existing Runway 27 SID procedures.

In summary, Ricondo confirmed the Authority's area definition captures the primary jet aircraft standard initial headings, identifies flights that changed heading after an initial heading prior to 1.5 NM from the shoreline, allows for some drift due to winds and piloting variation, and accounts for aircraft that initiate the initial heading turn prior to reaching the departure end of Runway 27. Ricondo believes the process the Authority uses to identify early turns as defined by Ricondo is appropriate. Therefore, an independent compliance analysis would likely result in similar results as those reported by the Authority.

The Authority monitors jet aircraft missed approaches and reports the number of missed approaches to the ANAC. However, missed approaches are not included as part of the early turn analysis. Because jet aircraft missed approaches are identified in the SCT SOP as part of the 1.5 NM turn requirement, Ricondo recommends the Authority include those in the analysis, but should not base it on the 265 and 295-degree headings. FAA ATC may direct jet aircraft missed approaches on multiple headings in order to maintain safe separation from other aircraft, which is in accordance to the 2018 SCT TRACON SOP.

Based on this analysis, Ricondo recommends the following:

- The Authority conduct analysis to monitor jet aircraft missed approach along any initial heading assigned by FAA air traffic control. If an aircraft is turned prior to 1.5 NM from the shoreline, it should be identified as non-compliant.
- The Authority continue to identify early turns based on current methodology and only change an early turn from non-compliant to compliant if FAA confirms an early turn was conducted to maintain safe separation.

3. AIRPORT NOISE ADVISORY COMMITTEE RECOMMENDATION 19

3.1 MODIFICATION OF STANDARD INSTRUMENT DEPARTURE (SID) FLIGHT PROCEDURES TO MITIGATE EARLY TURNS

The intent of ANAC Recommendation 19 was to work with FAA and ATC to modify flight procedures to increase compliance and reduce early turns, with consideration of aircraft performance.

All the Runway 27 SIDs published as of the date of this memorandum (ZZOOO, BORDER, PADRZ, PEBLE, CWARD, MMOTO, ECHHO, and FALCC SIDs) conform with the procedures in the SCT SOP restricting early turns. The procedure design for each SID enables jet aircraft to maintain an initial departure heading until 1.5 NM from the shoreline. SIDs that direct jet aircraft to the south then east (ZZOOO and BORDER SIDs) enable aircraft to remain south of the Point Loma residential area, north of the Fort Rosecrans National Cemetery. An RNAV SID does not exist for eastbound departures that are assigned the nighttime noise abatement heading between 10:00 p.m. and 6:30 a.m. Alternatives assessed for ANAC Recommendation 15 include an RNAV SID design to keep aircraft on initial heading until 1.5 nautical miles west of the shoreline and south of the Point Loma residential area.

As documented in the February 20, 2019 ANAC Agenda Package, the number of early turns has decreased since new or amended RNAV SID procedures were implemented in 2016. In 2015, the Authority recorded 1,293 early turns. In 2018, the Authority recorded 269 early turns. This represents a 79 percent reduction in early turns as a result of implementing the RNAV SIDs. The jet departures counted as early-turn operations did not appear to be following a RNAV SID procedure and were radar vectored. For those that are radar vectored, it appears aircraft are directed to another waypoint to re-join the RNAV SID further east.

Preliminary flight procedure design concepts developed as part of ANAC Recommendations 14 and 15 include designs intended to increase compliance for initial jet departure heading until 1.5 NM west of the shoreline and for the routes to remain south of the Point Loma residential area north of the Fort Rosecrans National Cemetery. Therefore, ANAC Recommendation 19 is being met as part of the efforts associated with ANAC Recommendations 14 and 15.

4. AIRPORT NOISE ADVISORY COMMITTEE RECOMMENDATION 20

4.1 INCORPORATION OF NOISE DOTS INTO FLIGHT PROCEDURES

ANAC Recommendation 20 is based on a conceptual design that incorporates noise dots into the SID procedures published for SDIA to enable data collection and compliance monitoring. The specific ANAC suggestions, included the following modifications to the current noise dots:

1. Reposition FAA Noise Dot #1 from its current position at 295 degrees to its "original" pre 2005 position at 290 degrees from end of Runway 27 and 1.5 miles off of the coast.
2. Reposition FAA Noise Dot #3 from its current position at 265 degrees to its "original" pre 2005 position of 275 degrees (JETTI) and 1.5 miles off of the coast.

3. Reposition FAA Noise Dot #4 from its current location (west of Fort Rosecrans) to coincide with the ZZOOO waypoint to deter regular early left turns inside of ZZOOO waypoint.

The purpose of the noise dots was to provide visual reference to assist SCT controllers with vectoring jet aircraft out over the ocean and south of the residential areas of Point Loma. An additional noise dot was added to vector jet aircraft over the ocean to provide abatement to Mission Beach residents. Aircraft can be turned off an initial departure heading after passing 1.5 nautical miles west of the coast, and south and eastbound jet departures can be turned east to stay south of the residential areas north of the Fort Rosecrans National Cemetery. The concept of redefining the noise dots to points in space where aircraft need to fly over, either by pilot navigation or via radar vectors, is not feasible. The following paragraphs provide detail related to the feasibility of the recommendation.

4.1.1 INCORPORATION OF NOISE DOTS IN RNAV SIDS

Two possible methods to incorporate reference points, like the noise dots, on a SID procedure, were considered;

- Depict the noise dots as reference points on a SID chart
- Co locating the noise dots on the radar screen with the waypoints used to define RNAV routes

The following sections describes the reasons why both methods are not feasible.

Depict Noise Dots as Reference Points on SID Charts

FAA Terminal Instrument Flight Rule (IFR) charts are controlled by the FAA Air Traffic Organization, Aeronautical Information Services. Terminal charts follow strict formats developed through collaboration with multiple FAA divisions as well as Air Line Pilots Association (ALPA), Aircraft Owners and Pilots Association (AOPA), Airlines for America (A4A) (formerly the Air Transport Association), Helicopter Association International (HAI), and the National Business Aviation Association, Inc. (NBAA). SID or STAR charts depict features to support the safe navigation to and from an airport and contain no ground features, other than obstacle points. The noise dots are unique to operations at SDIA and procedures used by SCT. They are not a component of instrument flight, are not navigational references, and are not defined in any aeronautical information publication. Because they are not relative to instrument flight operations, it is not feasible to incorporate into a SID chart.

Co-locating Noise Dots on the Radar Screen with Waypoints for RNAV Routes

Changing the location of the noise dots to coincide with waypoints represents a major change to the way the noise dots are used today from shoreline distance references to points in space where aircraft need to cross. This would increase controller's workload and create difficulties in ensuring flight track compliance.

ATC issued radar vectors will continue to occur as needed for separation purposes. For these operations, a controller would be required to vector the aircraft from point to point increasing the workload as compared to operations today. Other variables such as winds, would further increase controller's workload as they monitor the vectored aircraft to determine heading corrections, so the aircraft may cross a designated point on a radar video map. This could detract from a controller's ability to monitor other aircraft, which would be considered an added safety risk.

Ensuring pilots and SCT controller compliance would be difficult due to the nature of dispersion associated with radar vector operations and performance based navigational accuracies as aircraft cross waypoints (of any type) or fixes. Dispersion is expected when aircraft fly over or near waypoints used to define an RNAV route. By definition, the performance requirements of a typical RNAV requires aircraft to be within 1 NM of a designed route. If the route

includes a turn at a waypoint, additional dispersion will occur, especially if the waypoint is a fly-by waypoint.[4] Therefore, use of a fly-by waypoint or a dot on a radar map as the sole means to monitor aircraft flying over a point in space is not feasible.

With a fly-over waypoint,[5] aircraft will fly over the designated point, but not always directly over the point. Aircraft can be as much as 1 NM from the waypoint. The predictability is also diminished for the following segment due to dispersion over the waypoint, coding requirements, and the variability of aircraft performance. Furthermore, the use of a fly-over waypoint in RNAV procedure design is not always feasible due to Flight Management System performance issues. For these reasons, they are not preferred by the FAA and should only be used where a special design problem necessitates the use of a fly-over waypoint or is operationally necessary for obstacle clearance.[6, 7] Use of a fly-over waypoint for all Runway 27 departures contradicts proposed designs for ANAC Recommendation 14, which are supported by CAC community members representing communities that requested consideration of ANAC Recommendation 14. Proposed design concepts for ANAC Recommendation 14 (Alternative 1 for nighttime departures) incorporate a fly-by waypoint to not only ensure aircraft do not turn prior to reaching 1.5 NM west of the shoreline, but that they also remain as far south as possible from La Jolla communities. Due to the FAA's preference towards fly-by waypoints in RNAV design, and the conflict with best meeting the intent of Recommendation 14, incorporating noise dots as fly over waypoints in Runway 27 RNAV SID designs is not feasible.

The current published SIDs and proposed design concepts for ANAC Recommendations 14 and 15 comply with the 1.5 NM turn requirement stated in the 2018 SCT SOP. Therefore, incorporating the noise dot into the route design would not provide added benefit or support compliance monitoring. Compliance monitoring can be conducted based on use of the published SIDs.

Some of the jet traffic that crosses the peninsula is associated with Runway 27 nighttime departure operations that turn south and then east. Currently, no RNAV SID is available for these operations, so aircraft must be radar vectored by SCT. The nighttime procedure design concept, developed as part of ANAC Recommendation 15, proposes an RNAV route with intended flight paths south of the peninsula near the ZZOOO waypoint. Although the current radar vector traffic over areas like Fort Rosecrans National Cemetery comply with the early turn definition, implementation of the proposed concept design would result in fewer aircraft over the southern area of the Point Loma Peninsula as intended under ANAC Recommendation 20.

---

[4] Fly-by waypoint is a point where a change in course occurs from one specified route to another, with an aircraft flying near, but not over, the waypoint. The resulting dispersion depends on the degree of the turn between the fly-by waypoint and the next waypoint on the route. Aircraft will begin the turn prior to reaching the waypoint. The fly-by waypoint is preferred as compared to a fly-over waypoint in RNAV procedure design due to the conservation of airspace.

[5] Fly-over waypoint is a point where aircraft must fly over before changing course or continue on a similar course. The waypoint may or may not identify a change in course from one specified route to another. Fly-over (FO) waypoint fixes may or may not identify a change in course from one specified route segment to another. Aircraft cannot start a turn prior to the waypoint. Fly-over waypoints require the protection of more airspace than that required for a fly-by waypoint and should be used only where special design problems necessitate it, such as being operationally necessary for obstacle clearance.

[6] US Department of Transportation, Federal Aviation Administration, FAA Order 8260.19F, *Flight Procedures and Airspace*. paragraph 4-7-3 a(2), January 9, 2014.

[7] US Department of Transportation, Federal Aviation Administration, FAA Order 8260.46F, *Departure Procedure (DP) Program*, paragraph 3-1-5 a(2), December 15, 2015.

4.1.2 NOISE DOTS #3 AND #4 RELOCATION CONCEPT

The modifications specified in Recommendation 20 appear to adjust eastbound jet aircraft departures from Runway 27 such that they would no longer cross the Point Loma Peninsula possibly reducing jet aircraft noise exposure levels over noise-sensitive areas such as Sunset Cliffs Natural Park, Fort Rosecrans National Cemetery, and Cabrillo National Monument.

An alternative to the ANAC recommendation is to adjust the location of the two southern noise dots farther south. This alternative accommodates jet departures directed on controller-issued vector headings while the existing ZZOOO SID keeps aircraft south of Point Loma. **Exhibit 2** depicts the recommended concept called ANAC Recommendation 20 Alternative 1. The concept moves Noise Dots 4 and 5 farther south to a point where the line between both points is just south of the Point Loma Peninsula and maintains parallel geometry to Runway 9-27.

Noise Dot 4 would be moved south to a point located 1.5 NM west of the shoreline and slightly south of the Point Loma Peninsula. Noise Dot 5 would move south to align with a course from Noise Dot 4 parallel to Runway 9-27.

Implementation of this alternative would require an FAA review of the concept for feasibility and to make a determination of potential effects it may pose on the FAA's ability to meet its mission and goals. Ricondo reviewed the concept with FAA to gather preliminary feedback on the concept. Based on preliminary review, FAA indicated the concept would likely impact their ability to meet their mission and goals to maintain safe and efficient management of traffic. Therefore, Ricondo believes if the concept is submitted to FAA, the likelihood of FAA rejecting the concept is high.

SOURCES: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, OpenStreetMap Contributors, and the GIS User Community, August 2018 (basemap); San Diego County Regional Airport Authority ANOMS data, 2018 (FAA noise dots); ESRI Data, 2010 (Airports); National Flight Data Center (NFDC), October 2018 (waypoint); Ricondo & Associates, Inc., October 2018 (alternatives).

NORTH 0 10,000 ft

EXHIBIT 2

ANAC RECOMMENDATION 20
ALTERNATIVE 1

P:\GIS\Projects\SAN\MXD\SAN_ANACRecommendation_Ex2_ANACRecommendation20_Alt1_20181128.mxd

APPENDIX A

Primary Source Material Not Available on Internet

APPENDIX A PRIMARY SOURCE MATERIAL NOT AVAILABLE ON INTERNET

- Email correspondence related to noise dot locations:
  - Among Authority staff, FAA staff, and community members in 2005 and 2016 related to noise dot latitudes and longitudes
  - Between FAA and Ricondo & Associates, Inc. related to video map noise dots
- Email correspondence from Authority staff providing ANOMS noise dot location latitude and longitudes
- Copy of Mr. Paul Grimes comment letter to the FAA Western Service Center, Operations Support Group, on the *SoCal Metroplex Draft Environmental Assessment, September 25, 2015*

APPENDIX A.1

Email Correspondence Related to Noise Dot Locations

Hollarn Garret

From: Frazee Dan
Sent: Tuesday, July 05, 2005 10:26
To: Hollarn Garret
Subject: FW: Coordinates of "new noise dots"

-----Original Message-----
From: James.K.Buckles@faa.gov [mailto:James.K.Buckles@faa.gov]
Sent: Tuesday, July 05, 2005 10:05 AM
To: Frazee Dan
Subject: Coordinates of "new noise dots"

DECIMALS OF DEGREES

324613N/1171646W 32.770277 N / -117.2794 W
324410N/1171658W 32.73611 N / -117.2827 W
324210N/1171653W 32.7027 N / -117.28138 W

12 [illegible] [illegible] [illegible]

Casey Schnoor

From: Carmona, Hugo <Hugo.Carmona@mail.house.gov>
Sent: Monday, February 22, 2016 12:01 PM
To: 'Casey Schnoor'
Subject: RE: ?

Flag Status: Flagged

Hey Casey - Barry forwarded those numbers to me last week. Take a look:

Here's the coordinates for the 5 points, going from North to South (the actual positions are the second set).

1) 32.788010, -117.277901 (32 47 16.8N)/117 16 40.5W)
2) 32.770274, -117.279442 (32 46 13N/117 16 46W)
3) 32.736111, -117.282776 (32 44 10N/117 16 58W)
4) 32.702503, -117.281386 (32 42 09N/117 16 53W)
5) 32.688060, -117.227768 (32 41 17N/117 13 40W)

-----Original Message-----
From: Casey Schnoor [mailto:casey.schnoor@cox.net]
Sent: Monday, February 22, 2016 12:00 PM
To: Carmona, Hugo
Subject: Re: ?

??

Sent from my iPhone

> On Feb 9, 2016, at 7:08 PM, Casey Schnoor <casey.schnoor@cox.net> wrote:
>
> Any word from Barry Davis on the waypoint lay/long information? Et al?
>
> Thx
> Casey
>
> Sent from my iPhone

From: Ed.Snow@faa.gov
To: Robert Varani
Subject: RE: Noise Dots on Radar Video Map
Date: Friday, April 20, 2018 10:55:31 AM

"Is it possible the noise dots were shown another way pre 2007?"

I was about to say no, then I found a copy of our SOP from 2003 that indicates the dots were there at that time. After searching around some, I was able to find the original request to add the dots to our video maps, it was in November 1998.

Original coordinates:

N32° 46' 15.00" W117° 16' 35.00"
N32° 04' 23.00" w117° 16' 35.00"
N32° 44' 30.00" w117° 16' 40.00"
N32° 43' 37.00" W117° 16' 45.00"
N32° 42' 44.00" W117° 16' 40.00"
N32° 41' 52.00" W117° 16' 37.00"
N32° 41' 17.00" W117° 15' 45.00"
N32° 41' 17.00" W117° 13' 40.00"

You can copy that list and then right click "Paste From System Clipboard" in TARGETS to place them. They appear to be closer to the shoreline than now, and that may be because the shoreline component of our map wasn't as accurate back then.

"When was SAN Class C and would that have effected systems at your facility?"

The San Diego area has been Class B (TCA) since a some time after the PSA Crash in the early 70's, I don't know the exact date. I think back then there were only TCA's and TRSA's and I don't know what KSAN was before it was a TCA.

"Was there a change from CARTS to STARS in the past?"

I think we changed to STARS in 2014 or 2015, all video maps were the same from one platform to the other.

Regards,

Ed Snow
Southern California TRACON
Operations Support Group
858-537-5982 Work
760-271-0816 Cell

From: Robert Varani [mailto:rvarani@ricondo.com]
Sent: Friday, April 20, 2018 6:35 AM

To: Snow, Ed (FAA) <Ed.Snow@faa.gov>
Subject: RE: Noise Dots on Radar Video Map

Ed,

First of all, let me thank you for your time on Thursday. It was very productive for us. Secondly, thanks for the information. It is interesting that no dots are shown pre 2007. Is it possible the noise dots were shown another way pre 2007 (physical marks on the screen, another video map, an entirely difference system?). I believe SoCal TRACON reorganized in the time period from 1999 to today. When was SAN Class C and would that have effected systems at your facility? Was there a change from CARTS to STARS in the past?

I will contact Shjonna and Jim and ask if they want to receive the data directly. I think there may be a process to follow.

Robert Varani, PMP, CM | Director

RICONDO
20 N CLARK STREET | SUITE 1500 | CHICAGO, IL 60602
TEL 312-606-0611 x 131 | **DIRECT** 312-212-8975 | **MOBILE** 612-618-7230

From: Ed.Snow@faa.gov [mailto:Ed.Snow@faa.gov]
Sent: Thursday, April 19, 2018 8:57 AM
To: Robert Varani <rvarani@ricondo.com>; Stephen Smith <ssmith@ricondo.com>
Cc: Brian.Fagan@faa.gov; Tracey.Johnson@faa.gov
Subject: Noise Dots on Radar Video Map

Robb,

I did some research this morning and looked through old files regarding the Noise Dots. They were not there in 2007, but were there in 2009, so I'm reasonably certain they were added sometime in late 2007 or 2008. The extra dot was added on 10-18-2012.

I don't have Mr. Payne's email address, if he was interested in this information can you share it with him?

Regards,

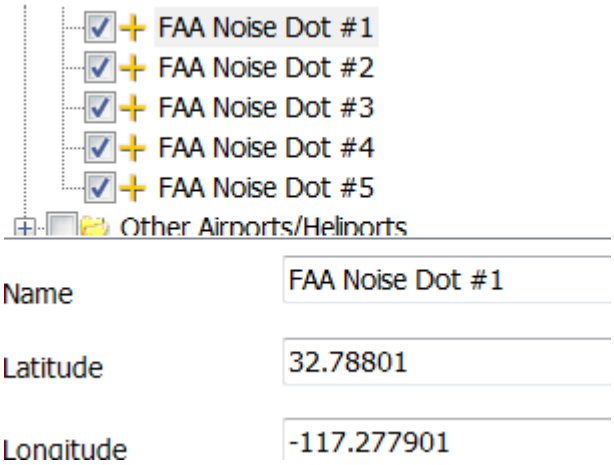
Ed Snow

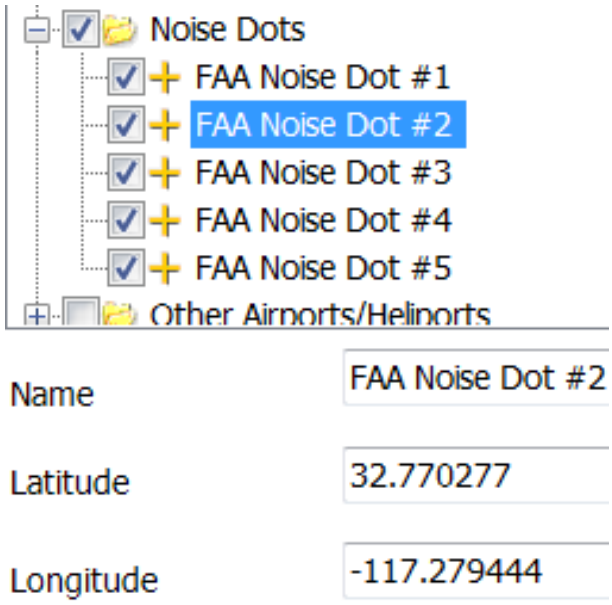
Southern California TRACON
Operations Support Group
858-537-5982 Work
760-271-0816 Cell

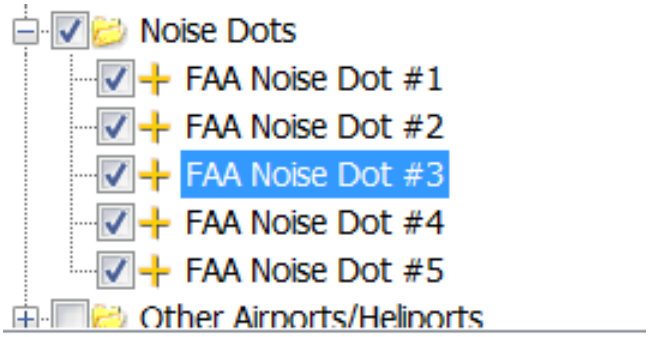
APPENDIX A.2

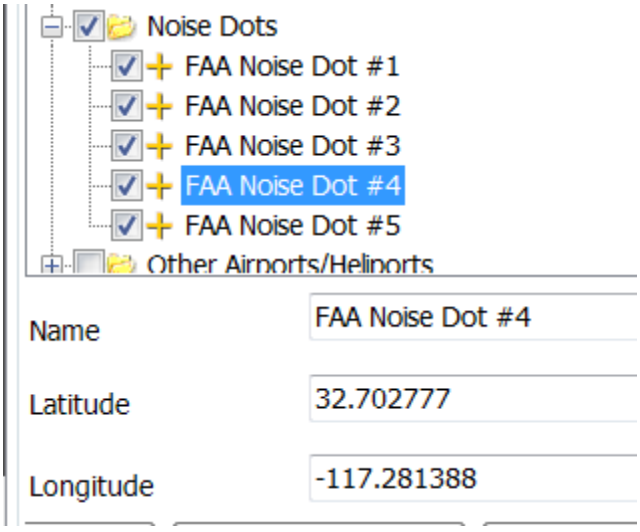
Noise Dot Location Data from the Authority's ANOMS

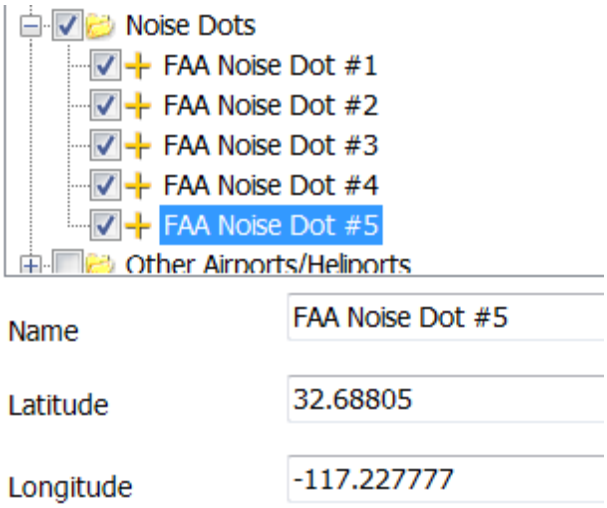
From: Knack Sjohnna [mailto:sknack@san.org]
Sent: Wednesday, February 28, 2018 4:24 PM
To: Stephen Smith <ssmith@ricondo.com>
Subject: RE: ANAC Recommendations 18-20






Noise Dots
FAA Noise Dot #1
FAA Noise Dot #2
FAA Noise Dot #3
FAA Noise Dot #4
FAA Noise Dot #5
Other Airports/Heliports
Name
FAA Noise Dot #3
Latitude
32.744238
Longitude
-117.281982


Noise Dots
FAA Noise Dot #1
FAA Noise Dot #2
FAA Noise Dot #3
FAA Noise Dot #4
FAA Noise Dot #5
Other Airports/Heliports
Name
FAA Noise Dot #4
Latitude
32.702777
Longitude
-117.281388



Sjohnna Knack
Program Manager | Planning & Environmental Affairs (Airport Noise)
San Diego County Regional Airport Authority
T 619.400.2639 | M.619.318.6894
sknack@san.org

APPENDIX A.3

Copy of Mr. Paul Grimes Comment Letter to the FAA Western Service Center

SoCal Metroplex EA
FAA, Western Service Center - Operations Support Group
1601 Lind Avenue SW
Renton, WA 98057

September 28, 2015

Subject: Federal Aviation Administration (FAA) Southern California Optimization of Airspace and Procedures in the Metroplex (SoCal Metroplex) Draft Environmental Assessment (EA) Document

To Whom It May Concern:

I would like to provide input and history on departures from San Diego Lindbergh Field (SAN). I reside near Point Loma Nazarene University and, along with many others, will receive more nuisance noise events from the proposed change in departures heading East at SAN. What criteria is the FAA using to propose these efficiency gains? Under $5 and 6 seconds per departure isn't worth changes that negatively affect neighborhoods.

Historically, commercial jets have been directed on a 275 degree heading for 3 miles offshore, then a mostly shallow left turn to clear the tip of Point Loma before turning east. In the late 1990's numerous aircraft were turning quicker, traversing over the Point Loma Peninsula. I attribute this to the higher performance of newer aircraft and increased non-stop service from San Diego.

U.S. Congressman Brian Bilbray was contacted and he engaged the FAA's Miramar facility. San Diego City Councilmember Byron Wear was also working toward an eventual agreement to keep the departures south of Point Loma on their eastbound trajectory. The FAA's Walter White came up with a solution to install "noise dots" on the Miramar monitors so that controllers would direct all departures through a gate of 2 dots to the west of SAN and a dot beyond the tip of Point Loma for eastbound aircraft to go around. This agreement, which required and gained air traffic controller union approval, has been in place for about 20 years with a high degree of successfully keeping aircraft over the Pacific Ocean.

The proposed new SAN IIBEE SID departure is in conflict with the nearly 20 year agreement. The proposed abandonment of the LOWMA fix (off the southern tip of Point Loma) in favor of a new fix, ZZOOO (on the Silver Strand) will direct aircraft to continue, and probably tighten their turn and head direct ZZOOO. Depending on aircraft type, takeoff weight, pilot, and other factors, the direct ZZOOO will create numerous tracks, of which most will be over Point Loma.

Looking at the current and proposed tracks of SAN IIBEE SID, it appears about 1 mile is cut from each average departure. From my calculations the fuel cost savings per departure of an average narrow body would be under $5. Since each aircraft continues to climb regardless of departure path, the saved 1 mile would be cut from the cruise portion of the flight, meaning about 6 seconds of en route time would be saved. While I'm all for efficiency, this proposed impacting change does little to improve efficiency.

Very recently, there appears to be a marked increase in early turns over the Pt. Loma Peninsula. I followed about 8 early turns on FlightAware in a 3 hour period last week. The most egregious violations have been after 10 pm on red eye transcons. For whatever reason, several flights on the POGGI FIVE RNAV departure have turned left at JETTI and avoided 3 waypoints to head direct Julian (JLI). These departures flew directly over residential areas of Pt. Loma, Naval Air Station North Island and Downtown San Diego. Of particular concern is that after either 9 or 10pm, all Runway 27 departures take a noise abatement 290 degree heading. With this more northern heading, aircraft on the proposed SAN IIBEE SID will cross the Pt. Loma Peninsula farther north at a time of day when the federal government and State of California deem noise as more impactful.

I thank the FAA for a second extension of public response on Metroplex SAN. I read the FAA's 2014 changes at PHX caused much pain for citizens and resulted in a lawsuit from the City of Phoenix. While new paths over Phoenix may not have created new 65dB areas, it greatly increased noise and nuisance from scores of jets over new areas that historically did not receive jet traffic. The FAA could be creating a parallel situation in Point Loma with the proposed SAN IIBEE SID departure. Again, what criteria is the FAA using to propose these efficiency gains?

I implore the FAA to modify the proposed SAN IIBEE SID departure to eliminate ZZOOO and retain LOWMA. This move will keep departures away from populated areas; maintain the noise dot agreement while providing a precise path for all departures, which is one of the goals of the Metroplex program. The San Diego Regional Airport Authority, operator of Lindbergh Field, also supports retention of the LOWMA waypoint, undoubtedly knowing that noise nuisance complaints will skyrocket.

Sincerely,

Paul Grimes
936 Moana Dr
San Diego, CA 92106

Public Member, Peninsula Community Planning Board Airport Subcommittee
Former Director of Schedule Planning, Pacific Southwest Airlines (PSA)
Former airport representative for San Diego Councilmember Byron Wear

CC:
Congressman Scott Peters
San Diego Mayor Kevin Faulconer
San Diego City Councilmember Lorie Zapf
San Diego County Regional Airport Authority

APPENDIX B

Historical Information Review and Summary

APPENDIX B HISTORICAL INFORMATION REVIEW AND SUMMARY

Ricondo & Associates, Inc. (Ricondo) conducted an independent assessment of the definition of an early turn for aircraft departing from Runway 27 at San Diego International Airport (SDIA) based on the source material described in this summary, and discussions with San Diego County Regional Airport Authority (the Authority) and Federal Aviation Administration (FAA) staff. Although multiple documents were made available and reviewed, and multiple discussions occurred there is no known record of an FAA-signed document establishing a formal agreement. The primary source document describing the establishment of noise dots and turns after 1.5 nautical miles (NM) west of the shoreline is a correspondence letter from Representative Brian Bilbray. Other documents verify the actions taken by FAA to incorporate dots on the Southern California Terminal Radar Approach Control (SCT) radar video maps, efforts to modify the dots as requested by FAA, and efforts to establish additional dots as requested by Authority staff to the FAA on behalf of Mission Beach residents. Each of the source documents is described herein.

B.1 CORRESPONDENCE FROM REPRESENTATIVE BRIAN BILBRAY ON OCTOBER 28, 1998 (REP. BILBRAY LETTER)[8]

The correspondence letter from US Congress Representative Brian Bilbray (the Rep. Bilbray letter) recounts an effort to address noise concerns from the Point Loma area based on two meetings that occurred in October of 1998.

The first meeting, convened on October 16, 1998, was attended by staff from Representatives Bilbray's office and representatives from the FAA Regional Administrator, Regional Executive Manager, San Diego Lindbergh Airport Traffic Control Tower (SAN ATCT), SCT and Operation Safety Program, San Diego Unified Port District Strategic Planning and Airport Noise representatives, Councilman Byron Wear's office representative, Point Loma residents, and the San Diego Health Department. At the meeting, FAA indicated no plans to use additional headings other than 275 and 290 degrees. FAA acknowledged that aircraft sometimes depart on a 250-degree heading for safety reasons. FAA proposed establishing marks on the radar screens to enable controllers to easily direct traffic out to sea and then back east over the Point Loma Peninsula, crossing land south of the residential areas on the peninsula.

The second meeting, convened on October 27, 1998, was attended by staff from Representative Bilbray's office, SCT, Councilman Wear's office representative, and Point Loma residents. The purpose of the meeting was to discuss the placement of the marks for incorporation on the FAA radar screens to aid in the directing of aircraft 1.5 miles out to sea before turning south, directing aircraft across the Point Loma Peninsula south of the Fort Rosecrans National Cemetery.

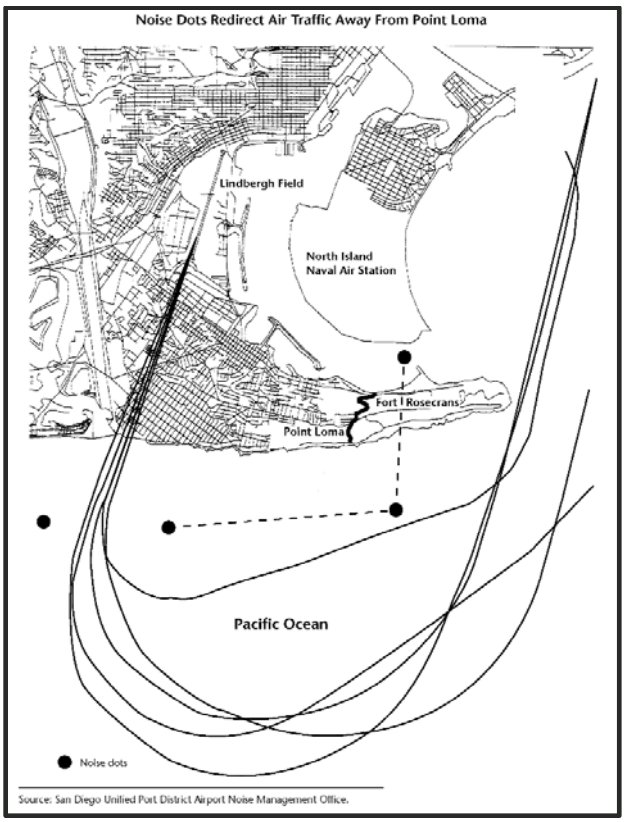
The letter uses the term "aircraft" generically and does not specify whether the efforts are for jet, turbo-propeller, or other propeller type aircraft. The letter also does not specify whether the unit of measure for miles is statutory or nautical.

[8] U.S. Representative Brian Bilbray, correspondence dated October 28, 1998. https://san.org/DesktopModules/Bring2mind/DMX/Download.aspx?EntryId=8661&Command=Core_Download&language=en-US&PortalId=0&TabId=341

B.2 CALIFORNIA STATE AUDITOR REPORT[9]

The California State Auditor report was reviewed as part of this analysis. Chapter 2 of the report entitled, *The Port District Cannot Impose Noise Restrictions Without FAA Approval, but It Can Improve Its Community Relations in Other Ways* includes a section titled, "The FAA's 'Noise Dots' Restrict Flights Over Residential Areas." This section provides a discussion of the efforts made in October 1998 described in the Rep. Bilbray letter; highlights the initial headings of 275 and 290 degrees directed by SAN ATCT; and provides a description of the procedures. **Exhibit B-1** presents a copy of the graphic in the report that depicts the noise dot locations and sample tracks of flights directed around the Point Loma Peninsula.

EXHIBIT B-1 NOISE DOTS GRAPHIC FROM 2000 CALIFORNIA STATE AUDITORS REPORT



SOURCE: The California San Diego International Airport at Lindbergh Field: Local Government, Including the San Diego Unified Port District, Can Improve Efforts to Reduce the Noise Impact Area and Address Public Dissatisfaction Report, October 2000.

The report did not define the noise dot locations with coordinates or bearings. Based on the procedure description in the California State Auditor report, three noise dots are located west of SDIA and each is approximately 1.5 miles from the shoreline. The two northern noise dots appear to define an area to which aircraft would proceed while on an initial heading assigned by the SAN ATCT. Aircraft can then turn south after passing these two noise dots. The noise dot south of the Airport and west of Point Loma appears to serve two functions. The first is a visual reference

[9] California State Auditor, Bureau of State Audits, *San Diego International Airport at Lindbergh Field: Local Government, Including the San Diego Unified Port District, Can Improve Efforts to Reduce the Noise Impact Area and Address Public Dissatisfaction*, Report No. 2000-126, October 2000). https://san.org/DesktopModules/Bring2mind/DMX/Download.aspx?EntryId=8661&Command=Core_Download&language=en-US&PortalId=0&TabId=341

for controllers issuing radar vectored headings to keep departures heading south 1.5 miles west of Point Loma shoreline. The second function is to identify where controllers can begin to issue radar vectored headings to the east. The fourth noise dot located south of the Airport and east of Point Loma serves as a visual reference, in combination with the noise dot west of the Point Loma Peninsula, to keep aircraft south of Point Loma residential areas.

The California State Auditor report indicates that departures are directed 1.5 miles west of the shoreline before turning south and are also directed so they do not cross the Point Loma Peninsula until they are south of the Fort Rosecrans National Cemetery. The example provided in the report indicates that aircraft do not fly to a specific point on a heading, rather fly to the departure gate defined by the noise dots located directly west of the Airport, then turn left to the south.

B.3 HISTORICAL SCT TRACON RADAR VIDEO MAPS (RADAR VIDEO MAPS) AND DATA[10]

In fall of 2017 and winter of 2018, Authority staff and Ricondo attended a meeting with the SCT to provide SCT an overview of the Flight Procedure Evaluation effort and request information necessary to establish a baseline understanding of the current air traffic control requirements related to SDIA traffic. Ricondo requested historical radar video maps used by FAA since November of 1998. In April 2018, FAA provided Ricondo radar video maps from 2007, 2009, 2012, and 2017[11]; a textual reference from the 2003 FAA Order 7110.65 *Southern California Terminal Radar Control Standard Operating Procedures* (2003 SCT SOP) indicating the existence of noise dots[12]; and noise dot coordinates from the original request made in November 1998 by FAA for the creation radar video map.[13]

Exhibit B-2 depicts a comparison of the 2007, 2009, and 2012 radar video maps. The radar video maps are for air traffic control navigation purposes and are may be difficult to understand for the average person as they do not show ground feature details. The intent of the graphic is to simply compare noise dot information that was listed for each year. Noise dots are not incorporated into the 2007 radar video map. FAA could not locate any information to determine why the 2007 version did not depict the noise dots. This does not mean that noise dots were not depicted on the radar video map prior to 2007, it just indicates that the noise dots were not depicted in 2007. The 2009 radar video map depicts four noise dots in locations consistent with those referenced in the California State Auditor report. The radar video map for 2012 depicts five noise dots. The 2017 radar video map, depicted on **Exhibit B-3**, includes the five noise dots at similar locations as indicated on the 2012 radar video map, along with original 1998 noise dot request as described below. The noise dots on the 2017 radar video map are shown in green on Exhibit B-3. These noise dots are located 1.5 NM miles from the shoreline with the exception of the dot located to the southeast in the channel between the Point Loma Peninsula and North Island Naval Air Station. According to FAA, the fifth noise dot was added on October 18, 2012.[14] The additional northern noise dot is related to the Authority's request to SCT on behalf of Mission Beach residents (refer to April 2016 Authority Staff Report below).

[10] Ed Snow, Federal Aviation Administration, "Noise Dots on Radar Video Map" email to Robb Varani, Ricondo & Associates, Inc., April 19, 2018.

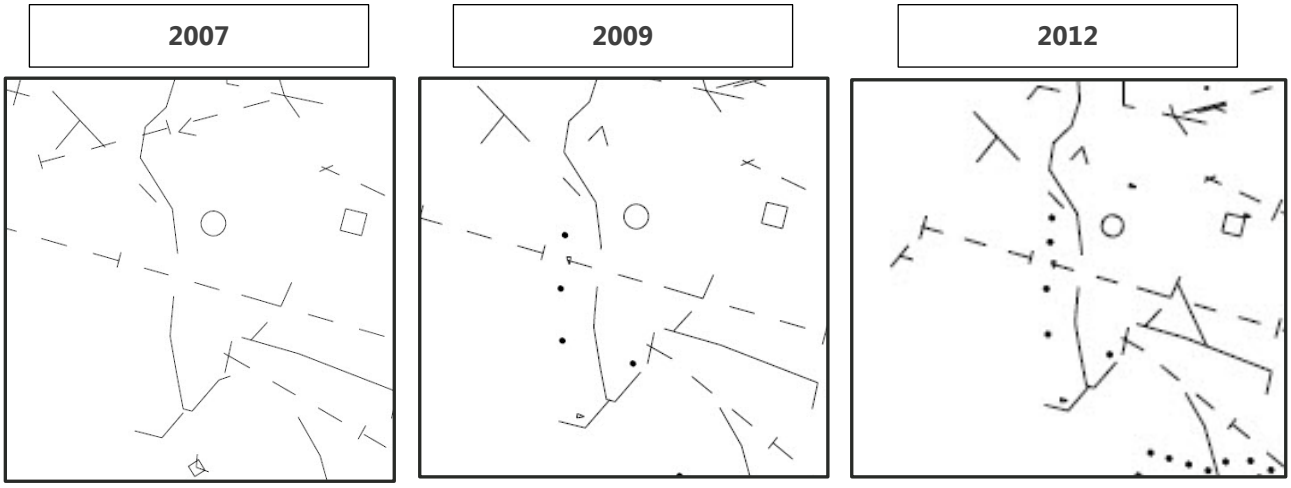
[11] Ed Snow, Federal Aviation Administration, "Noise Dots on Radar Video Map" email to Robb Varani, Ricondo & Associates, Inc., April 19, 2018.

[12] Ed Snow, Federal Aviation Administration, "Noise Dots on Radar Video Map" email to Robb Varani, Ricondo & Associates, Inc., April 20, 2018.

[13] Ed Snow, Federal Aviation Administration, "Noise Dots on Radar Video Map" email to Robb Varani, Ricondo & Associates, Inc., April 20, 2018.

[14] Ed Snow, Federal Aviation Administration, "Noise Dots on Radar Video Map" email to Robb Varani, Ricondo & Associates, Inc., April 19, 2018.

EXHIBIT B-2 RADAR VIDEO MAP COMPARISON – 2007, 2009, 2012



SOURCE: Ed Snow, Federal Aviation Administration, "Noise Dots on Radar Video Map" email to Robb Varani, Ricondo & Associates, Inc., April 19, 2018.

SOURCES: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, OpenStreetMap Contributors, and the GIS User Community, August 2018 (basemap); Federal Aviation Administration, 1998 (noise dots); ESRI Data, 2010 (Airports); National Flight Data Center (NFDC), October 2018 (waypoint); Ricondo & Associates, Inc., October 2018 (alternatives).

NORTH 0 10,000 ft

EXHIBIT B-3

NOISE DOT LOCATION COMPARISON
(REQUESTED 1998 REQUESTED AND 2017 RADAR VIDEO MAPS)

P:\GIS\Projects\SAN\MXD\SAN_ANACRecommendation_ExB-3_ANACRecommendation_1998_RadarMapRequest_20181128.mxd

Table B-1 lists the coordinates received from FAA of the noise dot locations from the original radar video map request in 1998. Ricondo was unable to confirm the original source of the information sent to the FAA, or any details related to the intent for each point.

TABLE B-1 NOISE DOT COORDINATES – 1998 (REQUEST)

NOISE DOT #	LATTITUDE (DMS)	LONGTITUDE (DMS)
1	N32° 46' 15.00"	W117° 16' 35.00"
2	N32° 04' 23.00"	W117° 16' 35.00"
3	N32° 44' 30.00"	W117° 16' 40.00"
4	N32° 43' 37.00"	W117° 16' 45.00"
5	N32° 42' 44.00"	W117° 16' 40.00"
6	N32° 41' 52.00"	W117° 16' 37.00"
7	N32° 41' 17.00"	W117° 15' 45.00"
8	N32° 41' 17.00"	W117° 13' 40.00"

NOTE:
DMS – Degrees Minutes Seconds
SOURCE: Ed Snow, Federal Aviation Administration, "Noise Dots on Radar Video Map" email to Robb Varani, Ricondo & Associates, Inc., April 20, 2018.

Exhibit B-3 depicts the requested 1998 noise dots as orange triangles (labeled 1998-1 through 1998-8) based on the coordinates listed in Table B-1. Exhibit B-3 also includes the 2017 radar video map with the noise dots depicted in green for comparison purposes.

Seven of the requested 1998 noise dots in Table B-1 are relevant to the efforts described in the Rep. Bilbray letter. Noise Point 2 from the table (not depicted on Exhibit B-3) is located further south along the United States/Mexico border and is thought to have been used for other purposes. A radar video map used between 1998 to 2007 was not available for this analysis; therefore, it is not possible to confirm whether all these dots were shown on the radar screen at the time. It is possible that four of the eight noise dots were selected by the FAA as a result of discussions with Point Loma and Representative Bilbray at the October 27, 1998, meeting. Four of the eight requested noise dots appear to be in locations consistent with the 2000 California State Auditor report but could not be confirmed without the location data used by the California State Auditor.

Ricondo requested SOP information as far back as 1998. FAA only provided Ricondo excerpts from the 2008 SCT SOP. However, FAA SCT staff confirmed that the 2003 SCT SOP included references to the noise dots, which indicates that action was taken by FAA as a result of the efforts described in the Rep. Bilbray letter.

Six of the requested 1998 noise dots appear slightly east of 1.5 NM from the shoreline. This was explained by FAA as a possible function of the radar system in use at the time. The radar system has since been upgraded to the Standard Terminal Automation Radar System. The requested 1998 points may also have been established using statute miles as the unit of measure instead of nautical miles.

B.4 SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY BOARD STAFF REPORT, ITEM #12, "STATUS UPDATE AND POSSIBLE ACTION ON COMMUNITY NOISE ISSUES ON NOISE DOTS," APRIL 21, 2016 (APRIL 2016 AUTHORITY STAFF REPORT)[15]

The April 2016 Authority Staff Report provides research conducted by Authority staff related to the origin and evolution of the noise dots, starting with the Rep. Bilbray letter and the California State Auditor report. The description also includes sections discussing modifications made to the noise dots, the evolution of definition of early turns, and historical noise dot location drawings submitted by community residents.

According to the April 2016 Authority Staff Report, the FAA made two modifications to the initial noise dots sometime in the mid-2000s. The first modification was made to the noise dot located south of the Airport and west of the Point Loma Peninsula (referred to today as Noise Dot 4) by FAA. Based on information reported by the Authority, the modification was conducted to allow an easier transition for heavy jets turning from the south to the east. Noise Dot 4 was moved 0.3 NM north. The move resulted in modifying the south boundary (which is defined by a straight line drawn between Noise Dots 4 and 5) to be parallel to SDIA Runway 9-27 instead of a straight east-west line. The modification maintained the original intent to keep aircraft overflights south of Point Loma Peninsula residential areas. The second modification was the addition of a new noise dot (now called Noise Dot 1) located 1.5 NM miles from the shore on a 295-degree magnetic heading from a location on Runway 27. This point was added at the request of Mission Beach residents to discourage aircraft from changing the SAN ATCT assigned initial departure heading before reaching 1.5 NM from the shoreline.

The report discusses the definition of early turns in several sections of the document as follows:

- Page 14 – "At the time of these two changes, FAA defined early turns as any aircraft that overflies the 295 degree heading to the right or the 258 degree heading to the left."
- Page 15 – "For right turning departures, the FAA considers "non-compliant" any aircraft that turns prior to clearing the 295 degree dot…The Authority concurred with FAA in using Dot 1 [Noise Dot 1] as its gauge for "early turns" to the right."
- Page 15 – "For left turning departures, the FAA considers "non-compliant" any aircraft that either 1) turns prior to clearing the 258 degree dot (Dot 3 above) [Noise Dot 3], or 2) turns eastbound without first clearing Dots 4 and 5 [Noise Dots 4 and 5]. However, to address community concern in the mid-2000's, the Airport Authority began using a different dot than the FAA's DOT 3 to represent early left turns. Rather than using the FAA's 258 degree dot [magnetic heading between a location prior to the end of Runway 27 to FAA's Dot 3], the Airport Authority began recording "early turns" using a narrower 265 degree dot [magnetic heading between a location prior to the end of Runway 27 to the Authority's proposed Noise Dot 3] to measure "non-compliance."
- Page 16 – "On March 22, 2016 Airport Staff requested the FAA TRACON staff to consider abandoning their 258 degree heading Dot 3, and begin using a more restrictive 265 degree heading."
- Page 17 – "Once again, the Authority has defined early turns to the right as those jet aircraft that turn prior to FAA Noise Dot 1 at the 295 degree heading to the right [magnetic heading between a location prior the end of

[15] San Diego County Regional Airport Authority Board, Staff Report, Item #12, "Status Update and Possible Action on Community Noise Issues on Noise Dots," April 21. 2016. https://san.org/DesktopModules/Bring2mind/DMX/Download.aspx?EntryId=8661&Command=Core_Download&language=en-US&PortalId=0&TabId=341

Runway 27 and Noise Dot 1]. Left early turns are defined as those jet aircraft that turn prior to the 265 degree heading to the left [magnetic heading between a location prior to the end of Runway 27 and Noise Dot 3]."

The report also includes a map provided by a Point Loma resident. The map depicted a history of noise dot locations since 1998 based on the resident's research and information. The map also identified a noise dot concept showing a preferred corridor from a 275-degree heading to a 295-degree heading. The report indicated further that the origin of some of the points was unknown.

B.5 EMAIL CORRESPONDENCE

Email correspondence was provided by the Authority and reviewed as part of this analysis. The first was a message from James K. Buckles (FAA) to Dan Frazee (previous SDIA Director of Airport Noise Mitigation for the Authority) in July of 2005.[16] The email subject was related to and contained "new noise dot" coordinates. This email was forwarded from Dan Frazee to Garret Holland (Authority staff) in July of 2005.

The second email was from Casey Schnoor (Point Loma resident) to Carmona Hugo (U.S. Congress Representative Peters staff) on February 9, 2016 requesting a status update on receiving noise dot latitude/longitude data from Barry Davis (previous FAA SCT Manager).[17] Carmona Hugo responded on February 22, 2016, with the latitude/longitude data for five points provided by Barry Davis.[18]

Ricondo compared the location data of the points provided in the July 2005 and February 2016 emails. The three points listed in the July 2005 email are included as part of the five points in the February 2016 email. A summary of the coordinate information in the email is provided in **Table B-2.**

TABLE B-2 NOISE DOT COORDINATES – FAA EMAIL CORRESPONDENCE

NOISE DOT	LATITUDE (DD)	LONGTIUDE (DD)	LATITUDE (DMS)	LONGTITUDE (DMS)
1	32.788010	-117.277901	N32° 47′ 16.8	W117° 16′ 40.0
2	32.770274	-117.279442	N32° 46′ 13.0	W117° 16′ 46.0
3	32.736111	-117.282776	N32° 44′ 10.0	W117° 16′ 58.0
4	32.702503	-117.281386	N32° 42′ 09.0	W117° 16′ 53.0
5	32.688060	-117.227768	N32° 41′ 17.0	W117° 13′ 40.0

NOTES:
DD – Decimal Degrees
DMS – Degrees Minutes Seconds
SOURCE: James K. Buckles, Federal Aviation Administration, "Coordinates of new noise dots" email to Dan Frazee, Federal Aviation Administration, July 5, 2005.

B.6 AUTHORITY AIRPORT NOISE AND OPERATIONS MONITORING SYSTEM (ANOMS) – NOISE DOT COORDINATE INFORMATION

For comparative purposes, a request was made to the Authority to provide the exact coordinates of noise dots used in ANOMS. Ricondo received the coordinate information, which is provided in **Table B-3**.

[16] James K. Buckles, Federal Aviation Administration, "Coordinates of new noise dots" email to Dan Frazee, Federal Aviation Administration, July 5, 2005.

[17] Casey Schnoor, "Re: ?" email to Carmon Hugo, February 22, 2016.

[18] Carmon Hugo, "Re: ?" email to Casey Schnoor, February 22, 2016.

TABLE B-3 NOISE DOT COORDINATES – ANOMS

NOISE DOT	LATTITUDE (DD)	LONGTITUDE (DD)
1	32.78801	-117.277901
2	32.770274	-117.279444
3	32.744238	-117.281982
4	32.702777	-117.281388
5	32.688050	-117.227777

NOTE
DD – Decimal Degrees
SOURCE: San Diego County Regional Airport Authority ANOMS data, 2018

A comparison was made of the coordinates in Tables B-1, B-2, and B-3, and the 2017 radar video map to determine if the noise dots have moved over time. **Exhibit B-4** depicts the comparison of noise dots over the years (i.e., requested 1998, FAA email correspondence, ANOMS, and the 2017 radar video map). Although there is no way to know if any of the requested 1998 was ever depicted on a radar map, it is clear to see the change in noise dot locations over time. The coordinates of ANOMS noise dots are reflective of the change made by the Authority to Noise Dot 3 in 2016. Exhibit B-4 confirms that the ANOMS noise dots are the same as the 2017 radar video map, except for Noise Dot 3. The FAA Noise Dot 3 appears to be slightly north and west of the ANOMS Noise Dot 3. Noise Dot 3 on the FAA 2017 radar video map is on a 266-degree magnetic heading from the end of Runway 27 and is slightly farther west from the shoreline. Ricondo recommends that the Authority coordinate with SCT to resolve differences in interpreting the location of Noise Dot 3.

B.7 FAA ORDER 7110.65B - SOUTHERN CALIFORNIA TERMINAL RADAR CONTROL STANDARD OPERATING PROCEDURES (2018 SCT SOP)[19]

A review of the 2018 SCT Standard Operating Procedures (2018 SCT SOP) was conducted as part of this analysis. The 2018 SCT SOP references the noise dots and specifies no vectored turns prior to 1.5 NM west of the shoreline for the air traffic control sectors[20] that manage SDIA departures from Runway 27 (the WIZKY, SOUTH BAY, and WEST sectors). The 2018 SCT SOP states the following:

> *Unless required for separation purposes, SAN turbojet* [jet] *departures and missed approaches must not be vectored off the initial route until one and one half (1 ½) nautical miles west of the shoreline. Additionally, aircraft routed south and east bound must be vectored to pass over or south of Fort Rosecrans. These restrictions are represented on the radar video map as a series of dots.*[21]

[19] FAA Order 7110.65B - Southern California Terminal Radar Control Standard Operating Procedures, March 29, 2018 (Confidential document made available for Ricondo & Associates, Inc. review by the Federal Aviation Administration).

[20] Air Traffic Control Sector: A geographic area of airspace designated for air traffic control

[21] FAA Order 7110.65B - Southern California Terminal Radar Control Standard Operating Procedures (Confidential document made available for Ricondo & Associates, Inc. review by the Federal Aviation Administration.

SOURCES: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, OpenStreetMap Contributors, and the GIS User Community, August 2018 (basemap); Federal Aviation Administration, 1998 (noise dots); ESRI Data, 2010 (Airports); National Flight Data Center (NFDC), October 2018 (waypoint); Ricondo & Associates, Inc., October 2018 (alternatives); James K. Buckles, Federal Aviation Administration, "Coordinates of new noise dots" email to Dan Frazee, Federal Aviation Administration, July 5, 2005.

NORTH

0 10,000 ft

EXHIBIT B-4

NOISE DOT COMPARISON
(ANOMS, 2017 RADAR VIDEO MAP, 2016, AND 1998 [REQUESTED])

P:\GIS\Projects\SAN\MXD\SAN_ANACRecommendation_ExB-4_ANACRecommendation_1998Comparison_RadarMapRequest_20181128.mxd

The referenced language defines the restrictions in place for SCT controllers to follow when managing Runway 27 departures and missed approaches. This language represents the most formal documentation about the daily operation of the noise dots. The statement provides an air traffic controller the ability to issue a turn prior to 1.5 NM from the shoreline if required for separation purposes. A second key element of the statement is the identification of jet departures; therefore, this restriction does not apply to propeller or turbine-driven propeller aircraft. A third key element is related to the initial route. The statement does not specify magnetic headings for initial routes. The requirement applies to any initial route issued by SAN ATCT or required in a standard procedure.

B.8 SOUTHERN CALIFORNIA TERMINAL RADAR APPROACH CONTROL AND LINDBERGH AIRPORT TRAFFIC CONTROL TOWER LETTER OF AGREEMENT (SCT-SAN ATCT LOA)[22]

The current Letter of Agreement (LOA) between the SCT and SAN ATCT was reviewed as part of this analysis. The LOA does not reference the noise dots or restrictions on departures or missed approaches. The agreement references the use of the multiple Instrument Flight Rule (IFR) and Visual Flight Rule (VFR) initial departure headings for multiple runway operating plans (e.g., West Plan, East Plan, and 9/27 Plan). The information indicates that jet aircraft follow initial magnetic headings of 275 degrees, 290 degrees, and those specified or designed in the published SIDs (e.g., ZZOOO, PADRZ, BORDER and PEBLE). The LOA also indicates that the 290-degree magnetic heading must be issued between the hours of 10:00 p.m. and 06:30 a.m.

B.9 MR. PAUL GRIMES COMMENT LETTER TO FAA WESTERN SERVICE CENTER, OPERATIONS SUPPORT GROUP, ON THE *SOCAL METROPLEX DRAFT ENVIRONMENTAL ASSESSMENT* (MR. GRIMES LETTER)[23]

Mr. Paul Grimes was one of the attendees on the October 16, 1998 teleconference call led by Rep. Bilbray. The Mr. Grimes letter, submitted as part of the FAA's Southern California Metroplex (SoCal Metroplex) Draft Environmental Assessment (EA) public comment period, provides historical information on SDIA departures to the FAA. The letter highlighted the efforts made by SCT and Representative Bilbray's office, points out issues with the aircraft on the POGGI FIVE SID (replaced by the ZZOOO SID), and identifies the concern that the proposed SAN IIBEE SID (the FAA's draft proposed action to replace the POGGI FIVE RNAV SID) would result in more noise over the Point Loma Peninsula. The letter further recommends the use of the LOWMA waypoint to keep departures farther south of Point Loma Peninsula. The proposed IIBEE SID did not have a waypoint south of the Point Loma Peninsula. For the Final SoCal Metroplex EA, the FAA proposed the ZZOOO SID, which included the ZZOOO waypoint south of the Point Loma Peninsula.

[22] Southern California Terminal Radar Approach Control and Lindbergh Airport Traffic Control Tower Letter of Agreement, June 27, 2017 (Confidential document made available for Ricondo & Associates, Inc. review by the Federal Aviation Administration).

[23] Paul Grimes, "Federal Aviation Administration (FAA) Southern California Optimization of Airspace and Procedures in the Metroplex (SoCal Metroplex) Draft Environmental Assessment (EA) Document," letter to SoCal Metroplex EA, FAA Western Service Center, Operations Support Group, September 28, 2015.

APPENDIX D

Procedure Design Concept Descriptions and Findings

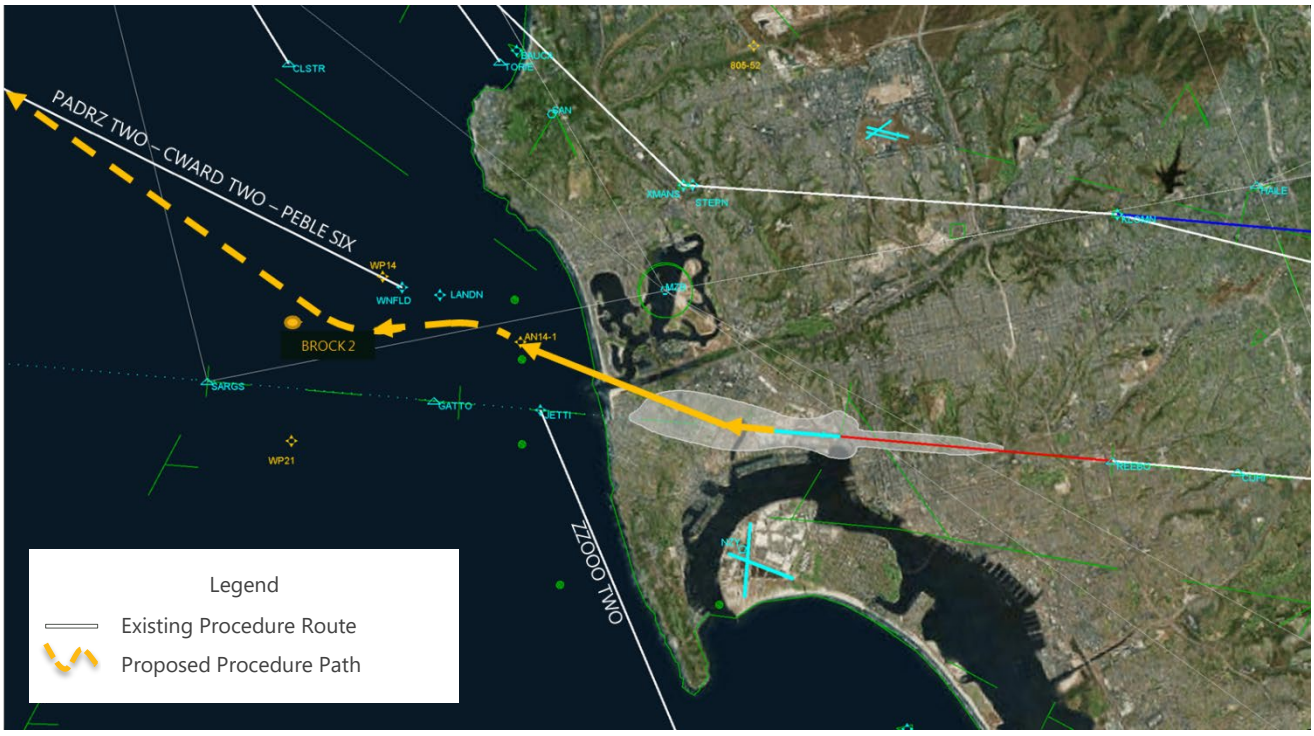
TABLE OF CONTENTS

APPENDIX D DESIGN CONCEPT DESCRIPTIONS

D.1 PRELIMINARY DRAFT DESIGN CONCEPT PHASE ALTERNATIVES

D.1.1 RECOMMENDATION 14 ALTERNATIVE 1 - FLY OVER TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 1 – FLY OVER TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Preliminary Draft Concept phase – Version 1
Description:	The concept involves a redesign of the PADRZ TWO SID using the same initial departure heading to a fly over waypoint located at one and a half (1.5) nautical miles (NM) from the shore, then to a new waypoint located due west, then to KERNL waypoint and the remaining waypoints on the PADRZ TWO Standard Instrument Departure (SID).
Intent:	Revise PADRZ SID or create a new procedure to reduce noise in the La Jolla and Pacific Beach areas.
Version Notes:	This is the initial version of the alternative design concept.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), procedure routes (white, blue and red) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure path and waypoints (orange)).
Graphic Reference: Presented to TAC on May 31, 2018 and CAC on July 19, 2018.

Screening Findings:

☒ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence ☐ ANAC Intent ☐ Charting Requirements ☐ Design Criteria ☐ Duplicate ANAC #

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility ☐ Safety

Design Notes:

- Keeps nighttime departures further south of La Jolla
- Increases flight distance approximately 1.4 NM compared to PADRZ TWO SID
- Compatible with proposed ANAC Recommendation 15 Alternative 3 design concept with fly over waypoint
- Not compatible with proposed ANAC Recommendation 15 Alternative 2 design concept with fly by waypoint due to different turn paths caused by a fly over versus fly by design-– would create a safety risk to potential converging traffic with aircraft on proposed Recommendation 15 Alternative 2 SID

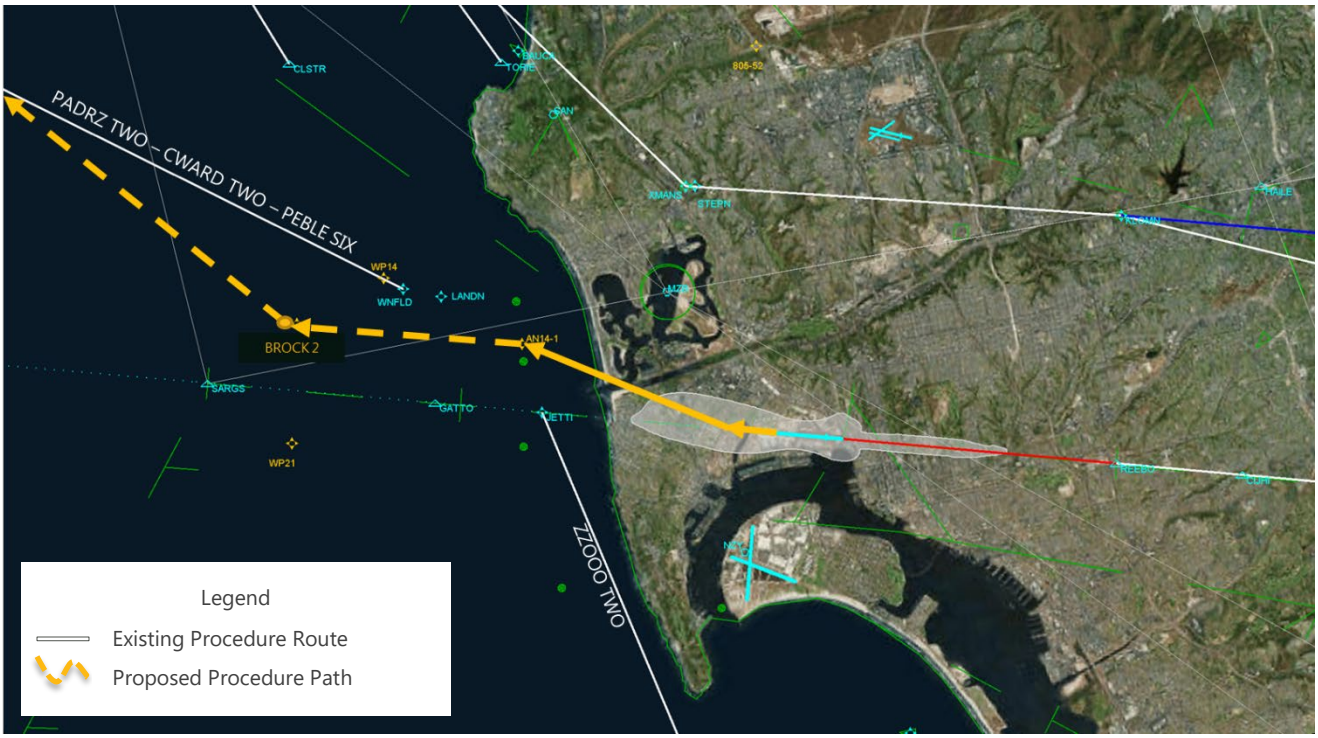
Summary Narrative:

ANAC 14 Alternative 1 (with Fly Over) is a modification of the PADRZ TWO SID to include a left turn to the west to stay further south of the La Jolla area. The design uses the same initial heading and RNAV coding that is used for the current PADRZ TWO SID to a new fly over waypoint, ANAC-14, located along the initial heading at 1.5 NM from the shoreline, then to BROCK2 waypoint, then back to KERNL waypoint and the remaining waypoints on the PADRZ TWO SID.

The design meets the intent of ANAC Noise Recommendation 14 and is compliant with the current restrictions used by the Southern California Terminal Radar Approach Control (SCT TRACON) for departures and missed approaches. Therefore, it was recommended to be passed to the Draft Design Concept phase of the project. Input from TAC and CAC required to determine fly over or fly by design preference.

D.1.2 RECOMMENDATION 14 ALTERNATIVE 1 – FLY BY TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 1 – FLY BY TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Preliminary Draft Concept phase – Version 1
Description:	The concept involves a redesign of the PADRZ TWO SID using the same initial departure heading to a fly by waypoint located at 1.5 NM from the shore, then to a new waypoint located due west, then to KERNL waypoint and the remaining waypoints on the PADRZ TWO SID.
Intent:	Revise PADRZ SID or create a new procedure to reduce nighttime noise in the La Jolla and Pacific Beach areas.
Version Notes:	This is the initial version of the alternative design concept.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), procedure routes (white, blue and red) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure path and waypoints (orange)).
Graphic Reference: Presented to TAC on May 31, 2018 and CAC on July 19, 2018.

Screening Findings:

☒ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps
☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence ☐ ANAC Intent ☐ Charting Requirements ☐ Design Criteria ☐ Duplicate ANAC #
☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility ☐ Safety

Design Notes:

- Keeps nighttime departures further south of La Jolla
- Increases flight distance approximately 1.4 nautical miles as compared to PADRZ TWO SID
- Compatible with proposed ANAC Recommendation 15 Alternative 2 design concept with fly by waypoint
- Not compatible with proposed ANAC Recommendation 15 Alternative 3 design concept with fly over waypoint due to different turn paths caused by a fly over versus fly by design-– would create a safety risk to potential converging traffic with aircraft on proposed Recommendation 15 Alternative 3 SID

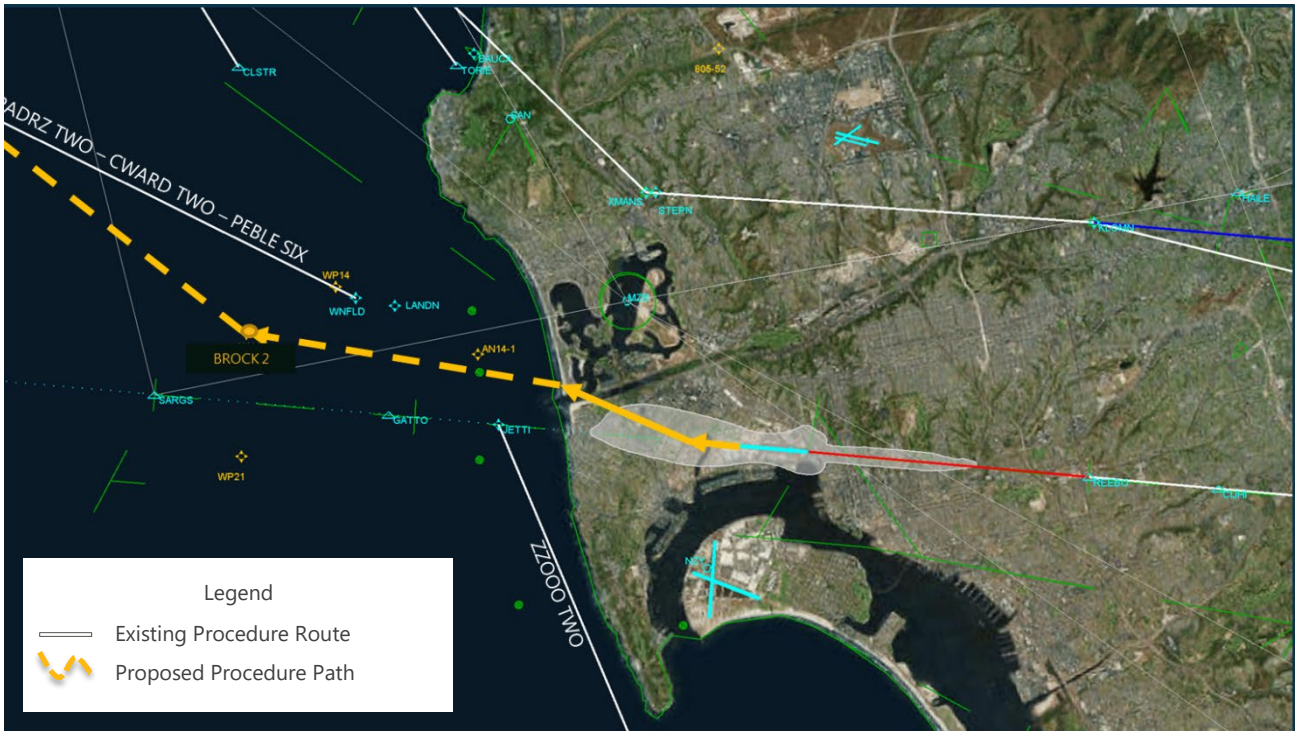
Summary Narrative:

ANAC 14 Alternative 1 (with Fly By) is a modification of the PADRZ TWO SID to include a left turn to the west to stay further south of the La Jolla area. The design uses the same initial heading and RNAV coding that is used for the current PADRZ TWO SID to a new fly by waypoint, ANAC-14, located along the initial heading at 1.5 NM from the shoreline, then to BROCK2, then back to KERNL and the remaining waypoints on the PADRZ TWO SID.

The design meets the intent of ANAC Noise Recommendation 14 and is compliant with the current restrictions used by SCT TRACON for departures and missed approaches. Therefore, it was recommended to be passed to the draft phase of the project. Input from TAC and CAC required to determine fly over or fly by design preference.

D.1.3 RECOMMENDATION 14 ALTERNATIVE 2 – TURN AT SHORELINE (NIGHTTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 2 – TURN AT SHORELINE (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Preliminary Draft Concept phase – Version 1
Description:	The concept involves a redesign of the PADRZ TWO SID using the same initial heading to a fly by waypoint located at the shoreline, then to a new waypoint, BROCK 2, located due west, then to KERNL and the remaining waypoints on the PADRZ TWO SID.
Intent:	Revise PADRZ SID or create a new procedure to reduce nighttime noise in the La Jolla and Pacific Beach areas.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), procedure routes (white, blue and red) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC on May 31, 2018 and CAC on July 19, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☒ 65 CNEL Influence ☐ ANAC Intent ☐ Charting Requirements ☒ Design Criteria ☐ Duplicate ANAC #

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility ☒ Safety

Design Notes:

- Keeps nighttime departures further south of La Jolla
- Increases flight distance approximately 0.54 NM compared to PADRZ TWO SID
- Not compatible with proposed ANAC Recommendation 15 Alternative 2 and 3 design concepts
- May not be feasible due to expected change in initial departure headings from Runway 27 and incompatibility to ANAC Recommendation 15 design concepts
- Ground track for heavy jets are expected to be south of existing initial departure paths over areas exposed to CNEL 65 or higher
- Not consistent with the current procedure in place restricting turns on departure prior to 1.5 nautical miles from the shoreline
- Fly Over waypoint did not pass TARGETS flyability assessment for this design alternative

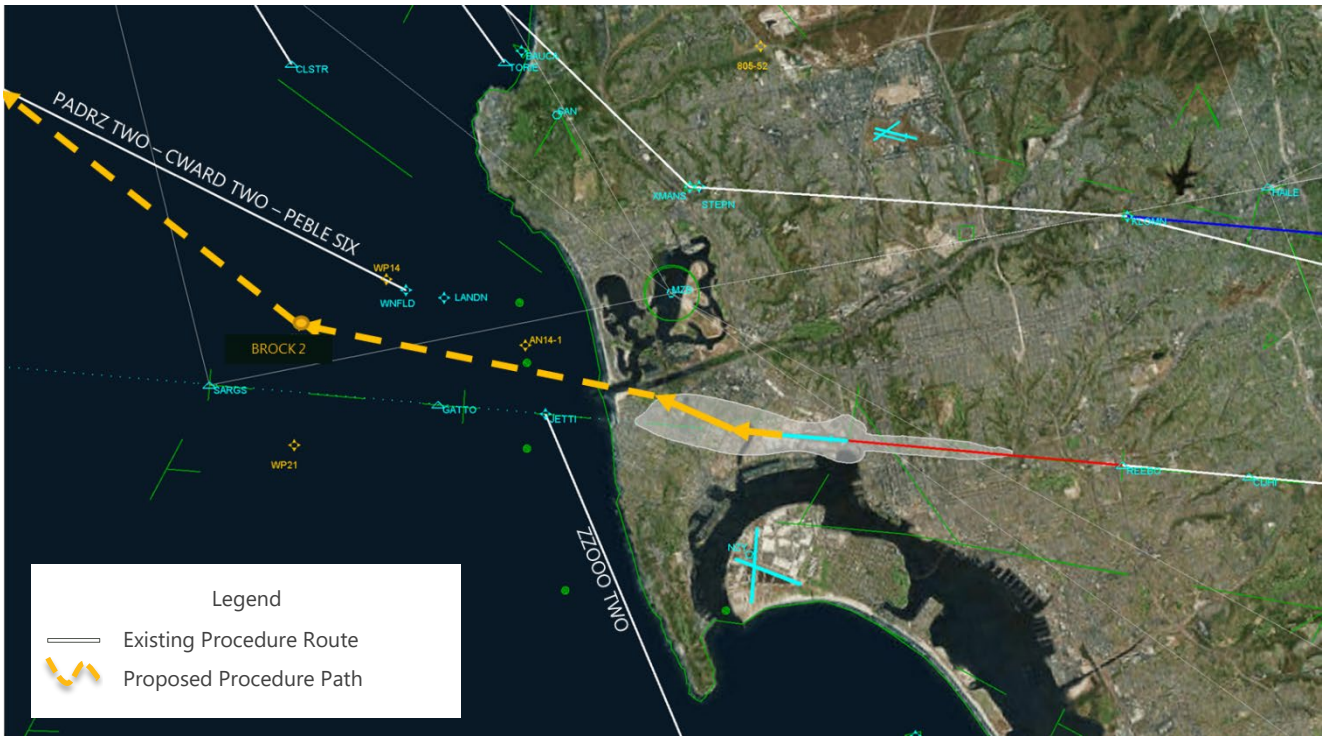
Summary Narrative:

ANAC 14 Alternative 2 predicated on Alternative 1, but is designed to turn aircraft west at the shoreline versus a waypoint located along the initial heading at 1.5 NM from the shoreline. Two versions of this alternative were attempted, one using a fly by waypoint and another using fly over waypoint. However, the fly over waypoint design did not pass the TARGETS flyability assessment because there is not sufficient distance from the runway end to the fly over waypoint at the shoreline for the aircraft avionics system to navigate and accurately execute intended flight path. Therefore, the fly over version of this alternative was not formally presented as an alternative.

The flyby design version is compliant with FAA criteria and passes the TARGETS flyability assessment. However, the modelled ground tracks for departing aircraft showed major dispersion and the inability of large and heavy aircraft to maintain the intended initial flight path. The modelled heavy aircraft would simply omit the waypoint at the shoreline resulting in a ground track that went from the runway end almost directly to the BROCK 2 waypoint. The dispersion of heavy jet aircraft reduces the predictability of the procedure; therefore, reducing the level of safety compared to the existing PADRZ SID design. The resulting flight path would shift noise south of the areas associated with the current departure track resulting in a shift in the CNEL 65. Due to these impacts the alternative was recommended to be eliminated from further consideration.

D.1.4 RECOMMENDATION 14 ALTERNATIVE 3 – TURN AT CNEL 65 DB CONTOUR (NIGHTTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 3 – TURN AT CNEL 65 DB CONTOUR (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Preliminary Draft Concept phase – Version 1
Description:	The concept involves a redesign of the PADRZ TWO SID using the same initial heading to a fly by waypoint located at the northwestern edge of the Community Noise Equivalent Level (CNEL) 65 decibel (dB) contour, then to a new waypoint, BROCK 2, located due west, then to KERNL and the remaining waypoints on the PADRZ TWO SID.
Intent:	Revise PADRZ SID or create a new procedure to reduce noise in the La Jolla and Pacific Beach areas.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), procedure routes (white, blue and red) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC on May 31, 2018 and CAC on July 19, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☒ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☒ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☒ Safety

Design Notes:

- Keeps nighttime departures further south of La Jolla
- Increases flight distance approximately 0.42 NM compared to PADRZ TWO SID
- Aircraft would turn left after initial heading prior to reaching 1.5 NM west of the shoreline
- Not compatible with proposed ANAC Recommendation 15 Alternative 2 and 3 design concepts
- Not feasible due to expected change in initial departure headings from Runway 27. Heavy jets are expected to be south of existing initial departure paths over areas exposed to CNEL 65 dB or higher
- Fly Over waypoint design does not meet FAA design criteria
- Does not pass TARGETS flyability assessment

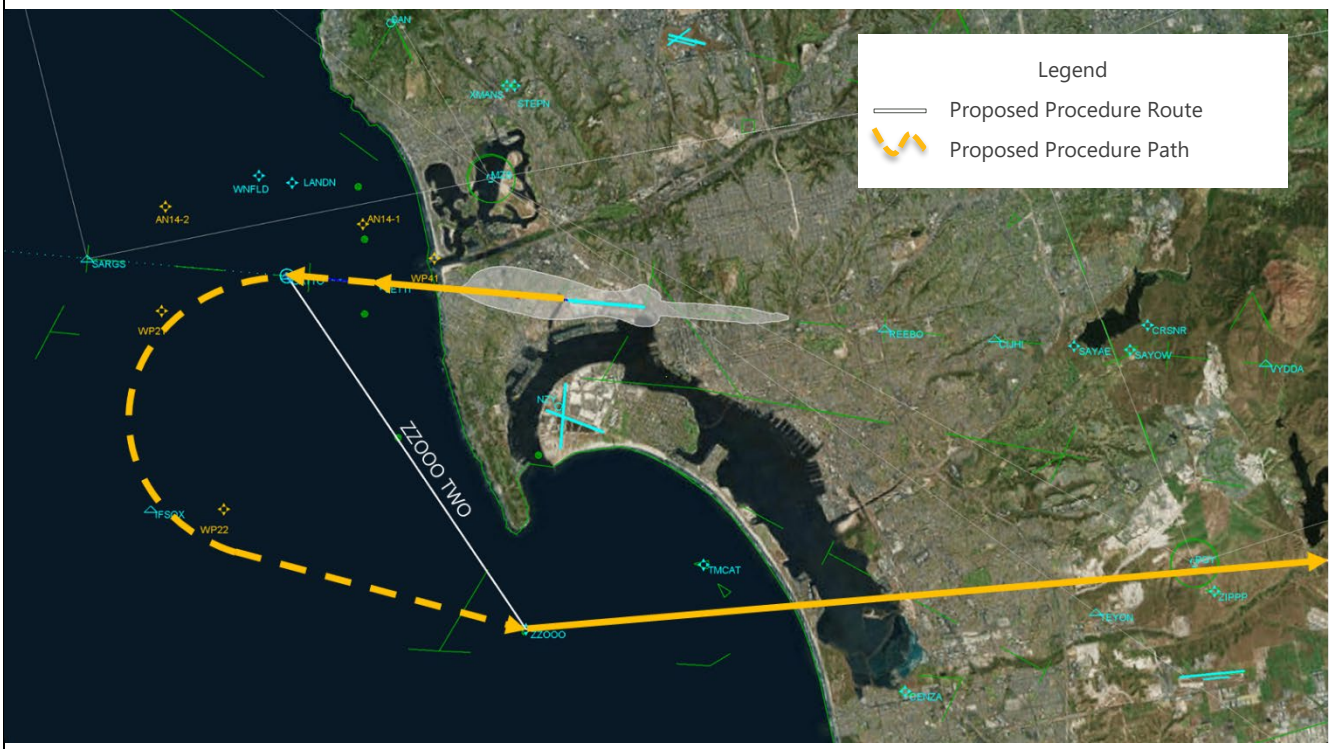
Summary Narrative:

ANAC 14 Alternative 3 is predicated on Alternative 2, but is designed to turn aircraft west at the edge of the CNEL 65 versus a waypoint located along the initial heading at the shoreline. Two versions of this alternative were attempted, one using a fly by waypoint and another using fly over waypoint. The fly over waypoint design did not meet FAA RNAV design criteria and did not pass the TARGETS flyability assessment, because there is not sufficient distance from the runway end to the fly over waypoint for the aircraft avionics system to navigate and accurately execute intended flight path. Therefore, the fly over version of this alternative was not formally presented as an alternative.

The fly by waypoint design passes the FAA criteria and flyability checks, but the modelled ground tracks for departing aircraft showed major dispersion and the inability of large and heavy aircraft to maintain the intended initial route. The modelled heavy aircraft would simply omit the waypoint at the CNEL 65 resulting in a ground track that went from the runway end almost directly to the BROCK 2 waypoint. The dispersion of heavy jet aircraft reduces the predictability of the procedure; therefore, reducing the level of safety compared to the existing PADRZ SID design. The resulting flight path would shift noise south of the areas associated with the current departure track resulting in a shift in the CNEL 65. Due to these impacts, the alternative was recommended to be eliminated from further consideration.

D.1.5 RECOMMENDATION 15 ALTERNATIVE 1 – EXTEND JETTI WAYPOINT TWO NM WEST (DAYTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 1 – EXTEND JETTI 2 NM WEST (DAYTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Daytime (6:30 a.m. to 9:59 p.m.) Departure
Version:	Preliminary Draft Concept phase – Version 1
Description:	The concept involves a modification of the ZZOOO TWO SID where the JETTI waypoint is moved two NM further west of its current location.
Intent:	Revise the ZZOOO SID to move departures further west of the Point Loma shoreline, reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to cross over ZZOOO waypoint at a higher altitude compared to current conditions.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure route (white) and proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC on May 31, 2018 and CAC on July 19, 2018.

Screening Findings:

- ☒ Pass to Draft
- ☐ Pass to Final
- ☐ Pass to Next Steps
- ☐ Pass to Part 150
- ☐ Eliminate

Reason for Elimination:

- ☐ 65 CNEL Influence
- ☐ ANAC Intent
- ☐ Charting Requirements
- ☐ Design Criteria
- ☐ Duplicate ANAC #
- ☐ Existing Compliance
- ☐ Not Applicable
- ☐ Noise Impact
- ☐ Operational Feasibility
- ☐ Safety

Design Notes:

- Meets minimum "direct to fix (DF) with a turn segment length" design criteria between JETTI and ZZOOO waypoints
- Designed without speed 230 kts speed limit
- Would increase frequency of aircraft over 8,000 feet Mean Sea Level (MSL) over ZZOOO waypoint
- Moves traffic away from Point Loma shoreline as aircraft proceed towards ZZOOO waypoint
- Would increase flight distance by 2.95 NM compared to existing ZZOOO SID
- Maintains all existing En Route transitions

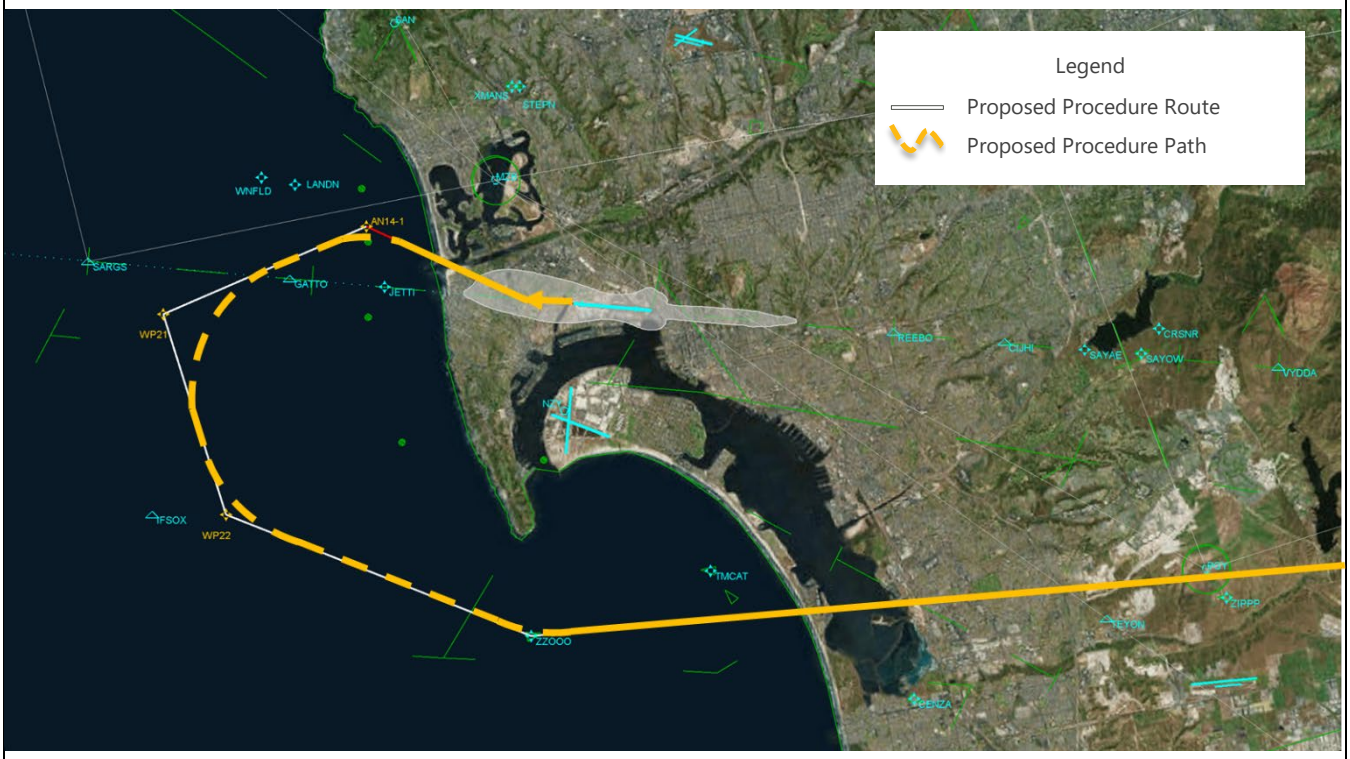
Summary Narrative:

This concept is designed to shift the JETTI waypoint further west with intent of keeping aircraft further away from the shoreline and to provide more flight track distance for aircraft to climb to achieve 8,000 feet at the ZZOOO waypoint. This alternative was also designed to remove the current speed restriction on the ZZOOO TWO required to ensure aircraft flyability from JETTI to ZZOOO.

The procedure design meets FAA criteria and passes the flyability assessment, and the intent of the recommendation. Therefore, it was recommended to be passed to the draft phase of the project.

D.1.6 RECOMMENDATION 15 ALTERNATIVE 2 – FLY BY TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 2 – FLY BY TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Preliminary Draft Concept phase – Version 1
Description:	The concept involves the development of a new SID using the initial heading design of the PADRZ TWO SID to a fly by waypoint located 1.5 NM from the shore, then to a new fly by waypoint, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.
Intent:	Revise the ZZOOO SID to significantly reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to reduce east bound turns over La Jolla.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure route (white) and proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC on May 31, 2018 and CAC on July 19, 2018.

Screening Findings:

☒ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Aircraft would turn left after initial heading at a fly by waypoint 1.5 NM west of the shoreline
- A Track to Fix leg design provides a more predictable path with less dispersion compared to the existing ZZOOO SID Fly Over to Direct to Fix leg design
- Fly by waypoint and Track to Fix leg design keeps nighttime departures south of Point Loma and increases altitude over ZZOOO waypoint
- Similar flight distance as compared to existing radar vector departures at night
- Compatible with proposed ANAC Recommendation 14 Alternative 1 nighttime design concept with fly by waypoint
- Not compatible with proposed ANAC Recommendation 14 Alternative 1 nighttime design concept with fly over waypoint due to different turn paths caused by a fly over versus fly by design– would create a safety risk to potential converging traffic with aircraft on Recommendation 14 Alternative 1 fly over turn
- Maintains all existing En Route transitions currently used as part of the ZZOOO TWO SID
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

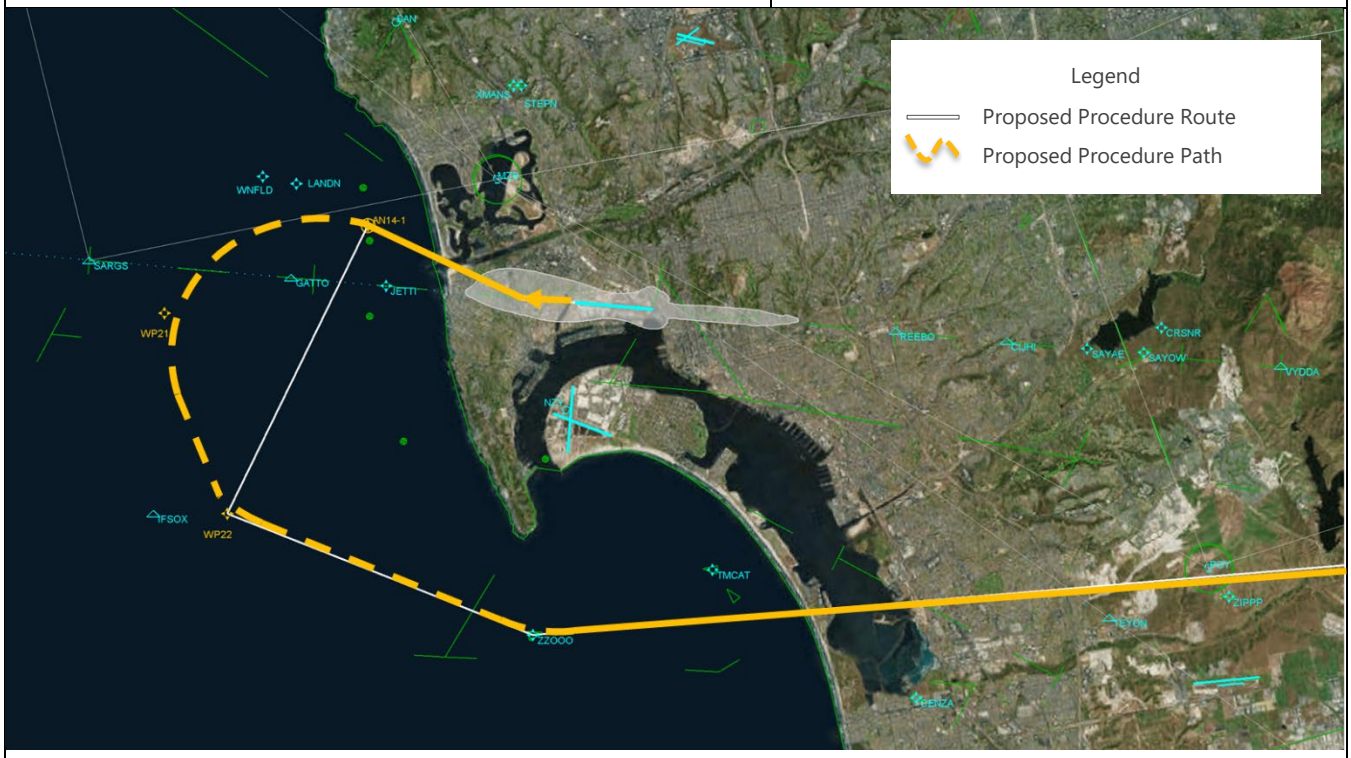
Summary Narrative:

Recommendation 15 Alternative 2 is predicated on the establishment of a new RNAV procedure for nighttime departures to the south and east when the Air Traffic Control Tower directs all jet departures to turn right after 10:00 p.m.. Currently, this is a radar vector only operation. The design of the procedure uses initial heading of the PADRZ TWO SID to a fly by waypoint, ANAC-14, located 1.5 NM from the shoreline. This is the same waypoint as used in Recommendation 14 Alternative 1 fly by design. Aircraft will then track to a new fly by waypoint located west of JETTI, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.

The procedure design meets the intent of the recommendation and FAA criteria, and passes the TARGETS flyability assessment. Therefore, it was recommended to be passed to the draft phase of the project. Input from TAC and CAC required to determine fly over or fly by design preference.

D.1.7 RECOMMENDATION 15 ALTERNATIVE 3 – FLY OVER TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 3 – FLY OVER WAYPOINT AT 1.5 NM FROM SHORELINE THEN TO ZZOOO (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Preliminary Draft Concept phase – Version 1
Description:	The concept involves the development of a new SID using the initial heading design of the PADRZ TWO SID to a fly by waypoint located 1.5 NM from the shore, then to a series of fly by waypoint to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.
Intent:	Revise the ZZOOO SID to significantly reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to reduce east bound turns over La Jolla.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure route (white) and proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC on May 31, 2018 and CAC on July 19, 2018.

Screening Findings:

☒ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Aircraft would turn left after initial heading at a fly over waypoint 1.5 NM west of the shoreline
- Fly over waypoint and Direct to Fix leg design keeps nighttime departures south of Point Loma and increases altitude over ZZOOO waypoint, but will have similar dispersion to the current ZZOOO SID traffic as aircraft head south to the ZZOOO waypoint
- Similar flight distance as compared to existing radar vector departures at night
- Compatible with proposed ANAC Recommendation 14 Alternative 1 nighttime design concept with a fly over waypoint
- Not compatible with proposed ANAC Recommendation 14 Alternative 1 nighttime design concept with a fly by waypoint due to different turn paths caused by a fly over versus fly by design – would create a safety risk to potential converging traffic with aircraft on proposed Recommendation 14 Alternative 1 with a fly by turn
- Maintains all existing En Route transitions currently used as part of the ZZOOO TWO SID
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Summary Narrative:

Recommendation 15 Alternative 3 is the similar to Recommendation 15 Alternative 2. The design of the procedure uses initial heading of the PADRZ TWO SID to a fly over waypoint, ANAC-14, located 1.5 NM from the shoreline. This is the same waypoint as used in Recommendation 14 Alternative 1 with a fly over waypoint design. Aircraft will then fly direct a new fly by waypoint located west of the JETTI waypoint, then track to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.

The procedure design meets the intent of the recommendation and FAA criteria, and passes the TARGETS flyability assessment. Therefore, it was recommended to be passed to the draft phase of the project. Input from TAC and CAC required to determine fly over or fly by design preference.

D.1.8 RECOMMENDATION 16 ALTERNATIVE 1 – CROSS LNTRN WAYPOINT AT 9,000 FT. TO I805/SR52 AT 7,000 FT. TO KLOMN WAYPOINT AT 6,000 FT.

ANAC RECOMMENDATION:	16 ALTERNATIVE 1 – LNTRN AT 9,000 FT. TO I805/SR52 AT 7,00 FT. TO KLOMN AT 6,000 FT.
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Arrivals
Version:	Preliminary Draft Concept phase – Version 1
Description:	The concept involves the revision of the COMIX STAR with direct routing from LNTRN waypoint to a new fly by waypoint at I805/SR52 to KLOMN waypoint. Aircraft will cross LNTRN at 9,000 feet, I805/SR52 at 7,000 feet, and KLOMN at 6,000 feet.
Intent:	Reassess and revive the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the North into a very narrow corridor over La Jolla area.
Version Notes:	This is the initial version of the alternative.

Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure route (white) and proposed procedure path (orange)).

Graphic Reference: Presented to TAC on May 31, 2018 and CAC on July 19, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence	☒ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Design includes proposed waypoint at I-805 and SR-52 and directs arrivals direct to KLOMN waypoint from LNTRN instead of going to the XMANS waypoint
- Increasing altitude at LNTRN waypoint to 10,000 feet not feasible due to descent gradient requirements (maximum of 330 feet per nautical mile) between LNTRN and the new I805/SR52 waypoint at 7,000 feet.
- Possible ATC issues with MCAS Miramar
- Moves noise from one community to another - may be deemed infeasible by FAA due to environmental concerns
- Maintains all existing En Route transitions for the COMIX STAR
- Reduces the flight track by one NM compared to the COMIX STAR

Summary Narrative:

Recommendation 16 Alternative 1 design is based on a conceptual flight path provided by ANAC. The conceptual flight path involves moving the XMANS waypoint to the intersection of I805 and SR52. This establishes a straight route from LNTRN to a new waypoint, I805-52 located at the intersection of I805 and SR52, then to the KLOMN waypoint. This design moves arrival traffic to the northern area of La Jolla near the Torey Pines golf course.

The altitudes used for this design are predicated on the COMIX TWO STAR. An attempt was made to raise the altitude at LNTRN to 10,000 feet. However, the descent gradient maximum from in the segment from LNTRN to I805-52 at 7,000 feet would be exceeded. Therefore, 9,000 feet was maintained at LNTRN.

The new route significantly changes the flight track for the arrival resulting in a shift in noise from one community to another. The new route also reduces the sequencing and spacing area available to SCT TRACON for arrivals and places traffic within the Miramar Marine Corps Air Station Airspace where possible conflicts may occur.

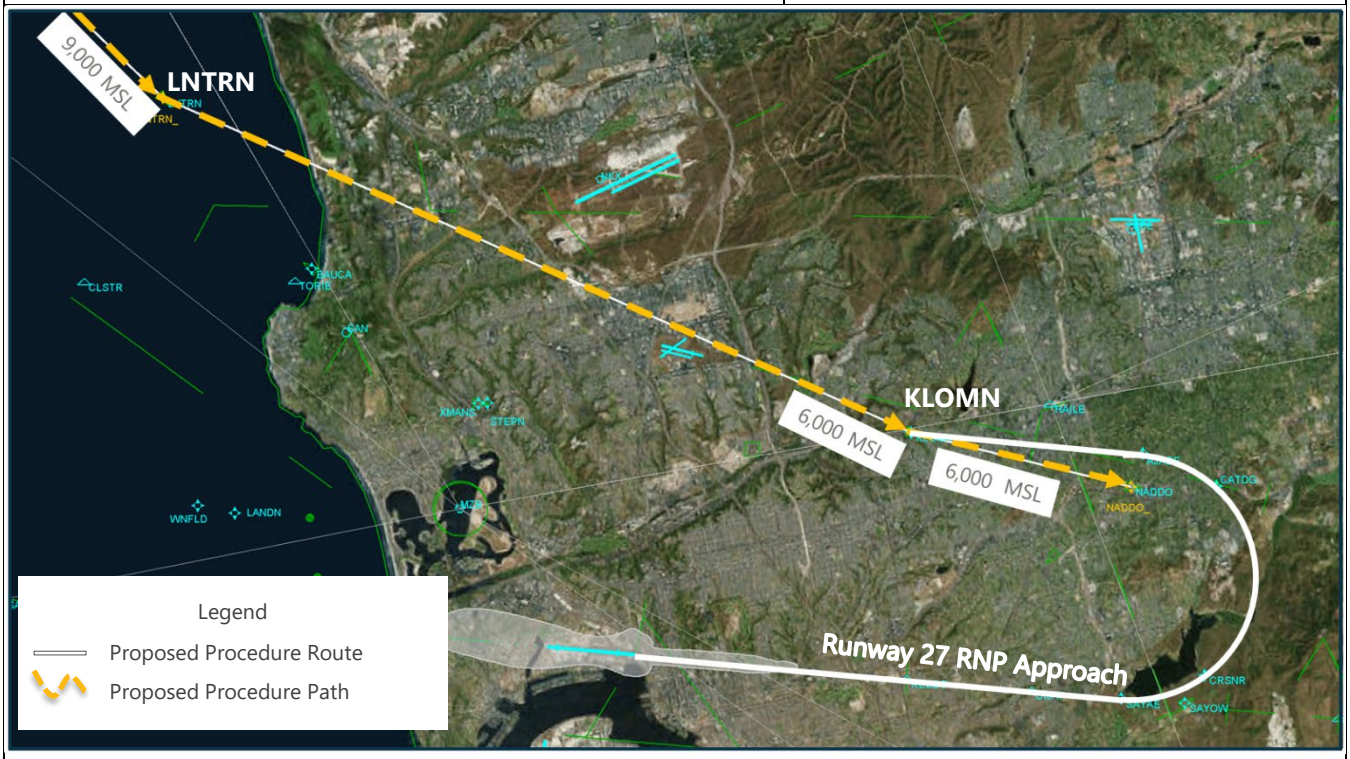
An evaluation was conducted based on the MITRE CAASD Guidance for Noise Screening of Air Traffic Actions, Revision 1.1 dated December 2012. The evaluation included the lateral or LAT test which is used to screen for potential noise impacts resulting from the lateral movement of a routes above 3,000 ft above ground level (AGL) that may occur by adding, removing or changing the location of a fix, assuming the location change occurs in isolation. The LAT test resulted in a "fail" indicating the proposed design may cause a change in Day/Night Noise Level (CNEL) exceeding the noise screening thresholds (a CNEL 3.0 dB increase for areas exposed to CNEL 60 to 65 levels or a CNEL 5.0 dB increase for areas exposed to levels between CNEL 45 and 60 dB).

At the May 31, 2018 TAC meeting, airline representatives indicated concerns related to the alternative design concepts for Recommendation 16 (arrivals from the north to Runway 27). They indicated the decent from LNTRN waypoint at 8,000 ft. MSL to KLOMN waypoint at 6,000 ft. MSL is already difficult to make for the navigation software onboard the aircraft, especially for aircraft with modern wing design (e.g. Embraer 175 and Boeing 737-MAX models). Steep descents in addition to speed reductions are not recommended for arrival procedures. This combination could lead some navigation software to reduce speed well before air traffic controller would like the aircraft to be at a slower speed leading to potential non-compliance to air traffic control instructions.

At the July 19, 2018 CAC meeting, CAC indicated this alternative design concept did not adequately meet the intent of Recommendation 16. This alternative represents the closest design to meet the intent, but. CAC requested the crossing altitude over the LNTRN waypoint to be increased to 10,000 ft. MSL. The Team eliminated Recommendation 16 Version 1, because it did not meet the intent of ANAC Recommendation 16. The Team added a design concept for consideration during the Draft Design Concept phase: Recommendation 16 Alternative 1 Version 2 (Cross LNTRN Waypoint at 10,000 ft. to I805/SR52 at 8,000 ft. to KLOMN Waypoint at 6,000 ft. CAC also requested the design for Recommendation 16 be part of the noise model screening analysis.

D.1.9 RECOMMENDATION 16 ALTERNATIVE 2 – CROSS LNTRN WAYPOINT AT 9,000 FT. DIRECT TO KLOMN WAYPOINT AT 6,000 FT.

ANAC RECOMMENDATION:	16 ALTERNATIVE 2 – LNTRN TO KLOMN
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Arrivals
Version:	Preliminary Draft Concept phase – Version 1
Description:	The concept involves the revision of the COMIX STAR with direct routing from LNTRN waypoint to KLOMN waypoint. Aircraft will cross LNTRN at 9,000 feet, and KLOMN at 6,000 feet.
Intent:	Reassess and revive the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the North into a very narrow corridor.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure route (white) and proposed procedure path (orange)).

Graphic Reference: Presented to TAC on May 31, 2018 and CAC on July 19, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence ☒ ANAC Intent ☐ Charting Requirements ☐ Design Criteria ☐ Duplicate ANAC #

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility ☐ Safety

Design Notes:

- Design includes proposed waypoint at I-805 and SR-52
- Reduces vectoring and sequencing area may be deemed infeasible by FAA
- Possible ATC issues with MCAS Miramar
- Moves noise from one community to another - may be deemed infeasible by FAA due to environmental concerns
- Maintains all existing En Route transitions for the COMIX STAR
- Reduces the flight track by one NM compared to the COMIX STAR

Summary Narrative:

Recommendation 16 Alternative 2 is an alternative design based on the suggestion provided in the ANAC recommendation and Alternative 1. The design establishes a straight route from LNTRN waypoint to KLOMN waypoint without the I805-52 waypoint, moving traffic away from La Jolla. The altitudes used for this design are predicated on the COMIX TWO STAR. The altitudes used were the same as used in Recommendation 16 Alternative 1. Aircraft would cross LNTRN waypoint at 9,000 feet and KLOMN at 6,000 feet.

Although FAA design criteria is met, the proposed concept route significantly changes the flight track for the arrival resulting in a shift in noise from one community to another. The new route also reduces the sequencing and spacing area available to SCT for arrivals and places traffic within the Miramar Marine Corps Air Station Airspace where possible conflicts may occur.

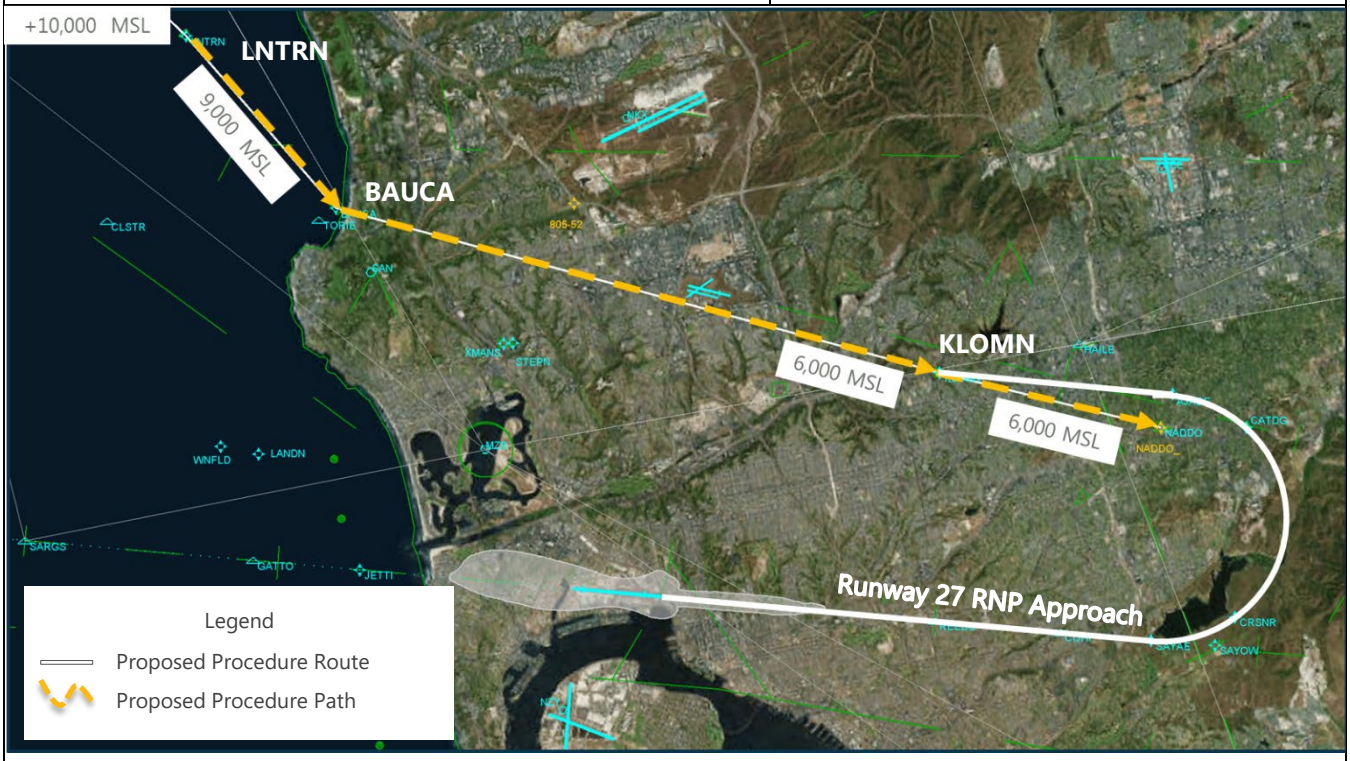
An evaluation was conducted based on the MITRE CAASD Guidance for Noise Screening of Air Traffic Actions, Revision 1.1 dated December 2012. The evaluation included the lateral or LAT test which is used to screen for potential noise impacts resulting from the lateral movement of a routes above 3,000 ft above ground level (AGL) that may occur by adding, removing or changing the location of a fix, assuming the location change occurs in isolation. The LAT test resulted in a "fail" indicating the proposed design may cause a change in Day/Night Noise Level (CNEL) exceeding the noise screening thresholds (a CNEL 3.0 dB increase for areas exposed to CNEL 60 to 65 levels or a CNEL 5.0 dB increase for areas exposed to levels between CNEL 45 and 60 dB).

At the May 31, 2018 TAC meeting, airline representatives indicated concerns related to the alternative design concepts for Recommendation 16 (arrivals from the north to Runway 27). They indicated the decent from LNTRN waypoint at 8,000 ft. MSL to KLOMN waypoint at 6,000 ft. MSL is already difficult to make for the navigation software onboard the aircraft, especially for aircraft with modern wing design (e.g. Embraer 175 and Boeing 737-MAX models). Steep descents in addition to speed reductions are not recommended for arrival procedures. This combination could lead some navigation software to reduce speed well before air traffic controller would like the aircraft to be at a slower speed leading to potential non-compliance to air traffic control instructions.

At the July 19, 2018 CAC meeting, CAC indicated this alternative design concept did not adequately meet the intent of Recommendation 16. CAC requested the crossing altitude over the LNTRN waypoint to be increased to 10,000 ft. MSL and include a waypoint at the I-805/SR52 intersection. The Team eliminated Recommendation 16 Alternative 2, because it did not meet the intent of ANAC Recommendation 16. The Team added a design concept for consideration during the Draft Design Concept phase: Recommendation 16 Alternative 1 Version 2 (Cross LNTRN Waypoint at 10,000 ft. to I805/SR52 at 8,000 ft. to KLOMN Waypoint at 6,000 ft.) and Recommendation 16 Alternative 2 Version 2 (Cross LNTRN Waypoint at 10,000 ft. to KLOMN Waypoint at 6,000 ft.). A version of Recommendation 16 Alternative 2 design without a waypoint at I-805/SR-52 was maintained as an option if Alternative 1 Version 2 was found to be not feasible.

D.1.10 RECOMMENDATION 16 ALTERNATIVE 3 – CROSS BAUCA WAYPOINT AT 9,000 FT. DIRECT TO KLOMN WAYPOINT AT 6,000 FT.

ANAC RECOMMENDATION:	16 ALTERNATIVE 3 – BAUCA TO KLOMN
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Arrivals
Version:	Preliminary Draft Concept phase – Version 1
Description:	The concept involves the revision of the COMIX STAR with routing from LNTRN waypoint to BAUCA waypoint to KLOMN waypoint. Aircraft will cross LNTRN at 10,000, BAUCA at 9,000 feet and KLOMN at 6,000 feet.
Intent:	Reassess and revive the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the North into a very narrow corridor.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure route (white) and proposed procedure path (orange)).

Graphic Reference: Presented to TAC on May 31, 2018 and CAC on July 19, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence ☒ ANAC Intent ☐ Charting Requirements ☐ Design Criteria ☐ Duplicate ANAC #

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility ☐ Safety

Design Notes:

- Design attempted to keep arrivals north of La Jolla when crossing over the shoreline
- Reduces vectoring and sequencing area may be deemed infeasible by FAA
- Moves noise from one community to another - may be deemed infeasible by FAA due to environmental concerns
- Does not pass TARGETS flyability for low performance aircraft crossing COMIX waypoint at 15,000 feet MSL
- Flight track is further south of MCAS Miramar compared to Alternatives 1 and 2
- Maintains all existing En Route transitions of the COMIX STAR
- Reduction in distance is less than one NM compared to the COMIX STAR

Summary Narrative:

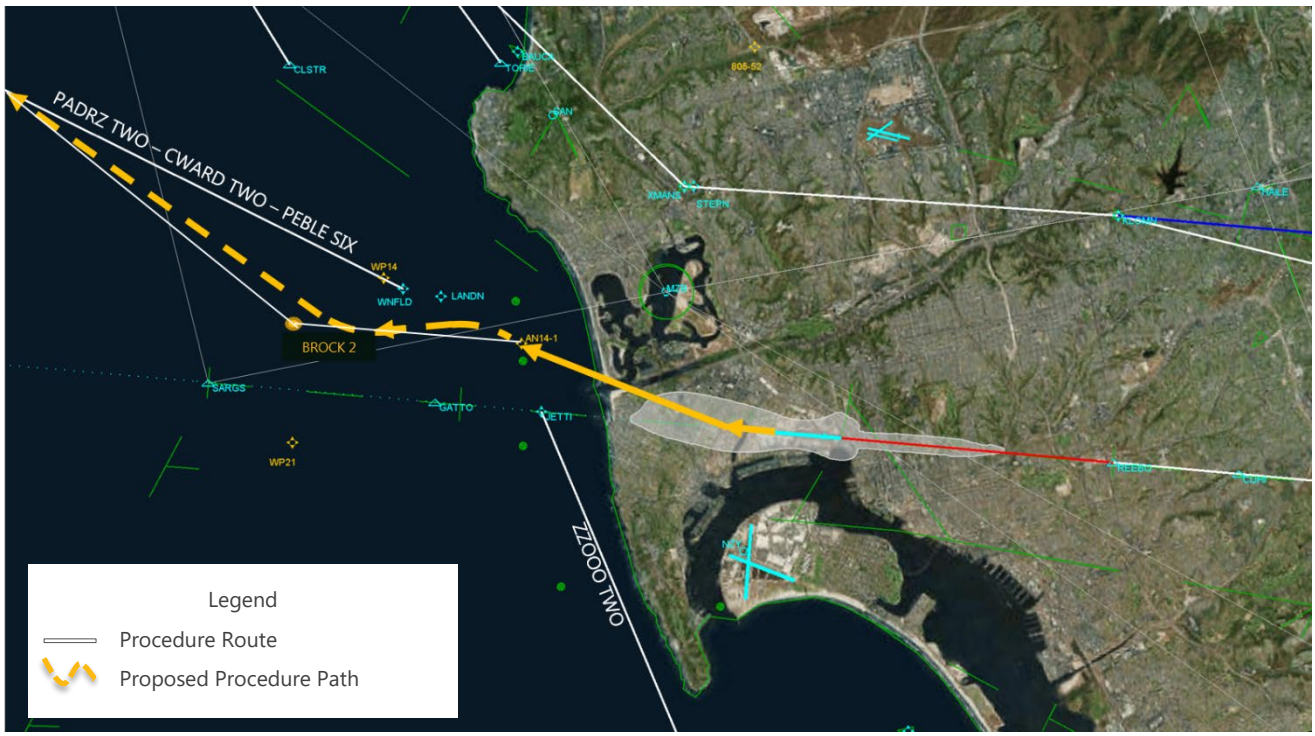
Recommendation 16 Alternative 3 was proposed as alternative route that would be further north of the existing flight path and south of the flight path associated with Recommendation 16 Alternatives 1 or 2. The altitudes used for this design were predicated on the COMIX TWO STAR.

At the July 19, 2018 CAC meeting, CAC indicated this alternative design concept did not adequately meet the intent of Recommendation 16. CAC requested the crossing altitude over the LNTRN waypoint to be increased to 10,000 ft. MSL and include a waypoint at the I-805/SR52 intersection. The Team eliminated Recommendation 16 Alternative 2, because it did not meet the intent of ANAC Recommendation 16. The Team added a design concept for consideration during the Draft Design Concept phase: Recommendation 16 Alternative 1 Version 2 (Cross LNTRN Waypoint at 10,000 ft. to I805/SR52 at 8,000 ft. to KLOMN Waypoint at 6,000 ft.

D.2 DRAFT DESIGN CONCEPT PHASE ALTERNATIVES

D.2.1 RECOMMENDATION 14 ALTERNATIVE 1 - FLY OVER TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 1 – FLY OVER TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Draft Design Concept – Version 1
Description:	The concept involves a redesign of the PADRZ TWO SID using the same initial heading to a fly over waypoint located at 1.5 NM from the shoreline, then to a new waypoint located due west, then to KERNL waypoint and the remaining waypoints on the PADRZ TWO SID.
Intent:	Revise PADRZ SID or create a new procedure to reduce nighttime noise in the La Jolla and Pacific Beach areas.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), existing procedure routes (white, final approach (red) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure route (white) and proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence	☒ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☒ Safety

Design Notes:

- Aircraft turn left after passing over waypoint located at 1.5 NM from shoreline
- Traffic patterns turning left after flying over waypoint is expected to be dispersed and not predictable compared to a fly by design
- Cause a S-turn type pattern for traffic heading north/northwest
- Keeps nighttime departures south of La Jolla, but closer to La Jolla compared to using a fly by waypoint.
- Increases flight distance approximately 1.43 NM compared to PADRZ departures at night
- Compatible with proposed ANAC Recommendation 15 Nighttime Alternative 3 design concept with Fly Over waypoint
- Not compatible with proposed ANAC Recommendation 15 Nighttime Alternative 2 fly by design concept due to potential loss of safe separation with following aircraft on proposed northbound SID as lead aircraft turns south towards ZZOOO waypoint

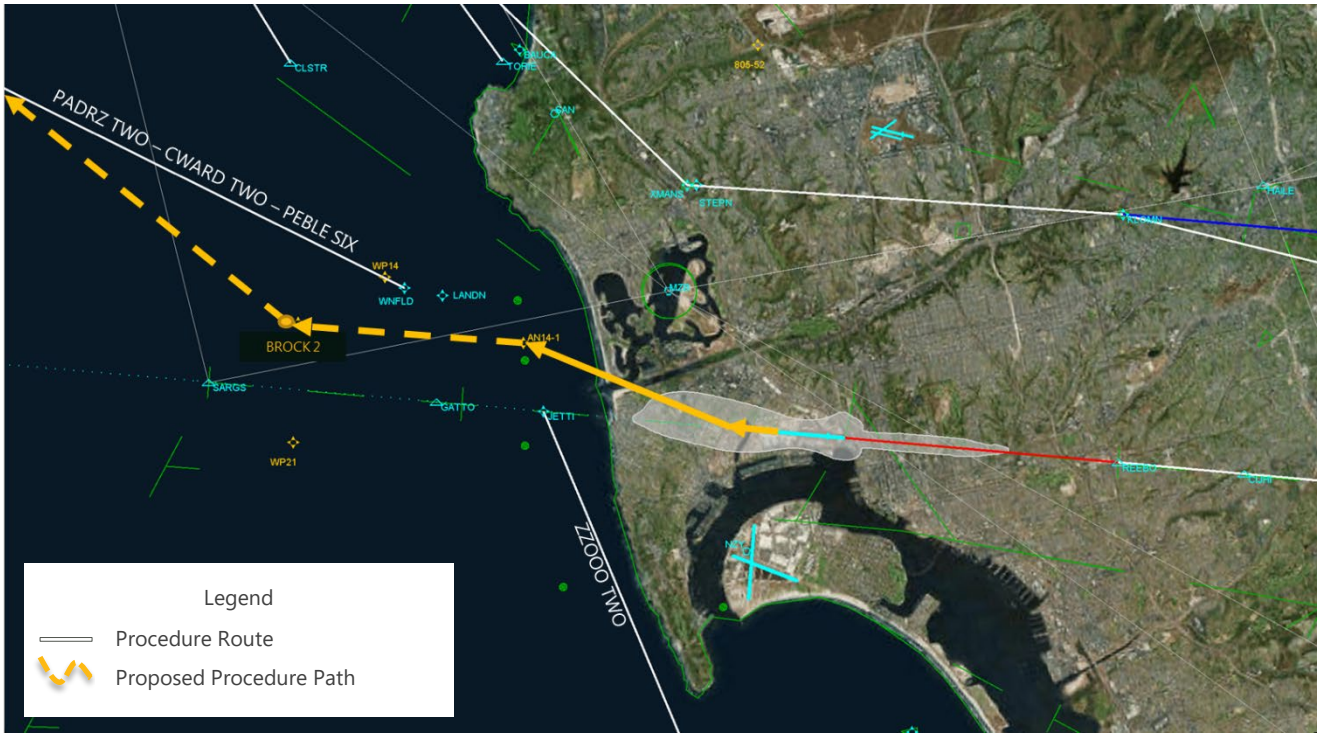
Summary Narrative:

Recommendation 14 Alternative 1 with a fly over waypoint is a modification of the PADRZ TWO SID to include a left turn to the west to keep aircraft further south La Jolla area during nighttime hours. The design uses the same initial heading and RNAV coding that is used for the current PADRZ TWO SID to a new fly over waypoint, ANAC-14, located along the initial heading at 1.5 NM from the shoreline, then to BROCK2, then back to KERNL and the remaining waypoints on the PADRZ TWO SID. No adjustments to the design were conducted between the Preliminary Draft Design Concept phase and the Draft Design Concept phase.

Further analysis was conducted in the draft phase of this alternative. The design meets the intent of Recommendation 14 and is compliant with the current restrictions used by SCT TRACON for departures and missed approaches. However, according to FAA criteria, a fly over waypoint should only be used when operationally necessary Second, a fly by waypoint design for eastbound departures and a fly over waypoint design for northbound departures is not compatible due to potential loss of safe separation with following aircraft on proposed northbound SID as lead aircraft heading east turns south towards ZZOOO waypoint. Third, the use of a fly over waypoint on this procedure will cause aircraft traffic patterns turning west to be unpredictable and track closer to La Jolla compared to a fly by waypoint design. At the August 30, 2018 CAC and TAC meetings, TAC and CAC indicated a preference to the fly by design as a means to best meet the intent of Recommendation 14 compared to the fly over design. Therefore, this procedure was recommended to be eliminated from further consideration based on the potential safety risks associated with the incompatibility between a fly by design for eastbound departures and a fly over design for northbound departures, and use of the CAC preferred fly by design that best meets the intent of Recommendation 14 to keep northbound departures further south of the La Jolla area. This design concept was recommended to be eliminated from further consideration.

D.2.2 RECOMMENDATION 14 ALTERNATIVE 1 - FLY BY TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 1 – FLY BY TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Draft Design Concept – Version 1
Description:	The concept involves a redesign of the PADRZ TWO SID using the same initial heading to a fly by waypoint located at 1.5 nautical miles from the shore, then to a new waypoint located due west, then to KERNL and the remaining waypoints on the PADRZ TWO SID.
Intent:	Revise PADRZ SID or create a new procedure to reduce noise in the La Jolla, Mission Beach, and Pacific Beach areas.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), existing procedure routes (white, final approach (red) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence ☒ ANAC Intent ☐ Charting Requirements ☐ Design Criteria ☐ Duplicate ANAC #

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility ☐ Safety

Design Notes:

- Keeps nighttime departures further south of La Jolla
- Increases flight distance approximately 1.43 NM as compared to PADRZ TWO SID
- Compatible with proposed Recommendation 15 Nighttime Alternative 2 design concept
- Not compatible with proposed Recommendation 15 Nighttime Alternative 3 design concept due to potential loss of safe separation with following aircraft on proposed northbound SID as lead aircraft turns south towards ZZOOO waypoint

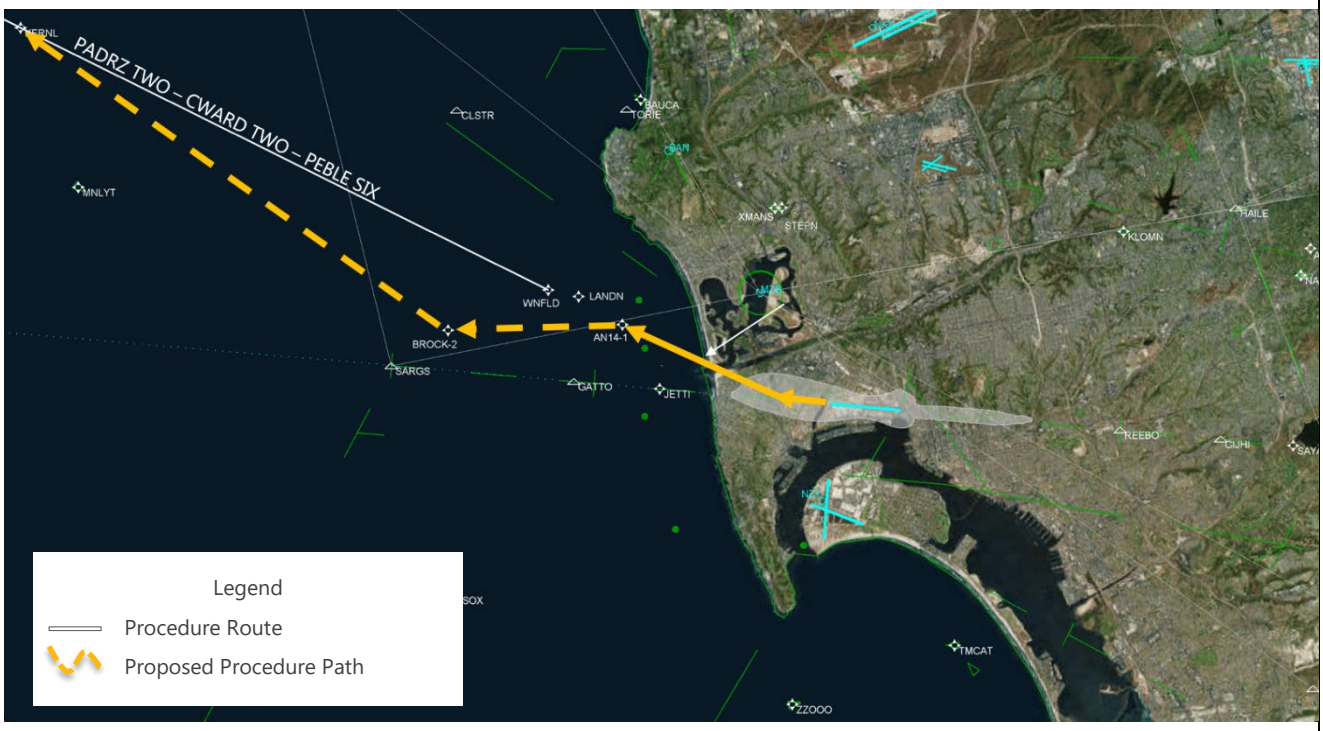
Summary Narrative:

Recommendation 14 Alternative 1 with a fly by waypoint is a modification of the PADRZ TWO SID to include a left turn to the west to keep aircraft further south of the La Jolla area for nighttime hours. The design uses the same initial heading and RNAV coding that is used for the current PADRZ TWO SID to a new fly by waypoint, ANAC-14, located along the initial heading at 1.5 NM from the shoreline, then to BROCK2, then back to KERNL and the remaining waypoints on the PADRZ TWO SID. No adjustments to the design were conducted between the Preliminary Draft Design Concept phase and the Draft Design Concept phase.

Further analysis was conducted as part of the draft phase of the project. The design meets the intent of ANAC Noise Recommendation 14 and is compliant with the current restrictions used by SCT TRACON for departures and missed approaches. However, through discussions with TAC and CAC at the August 30, 2018 meeting, there was a concern that aircraft would turn west prior to the established noise dots located 1.5 nautical miles from the shoreline due to the Distance Turn Anticipation (DTA) associated with the fly by waypoint. As a result, this design was recommended to be eliminated and replaced with Recommendation Alternative 1 with fly by waypoint Version 2 that moves the waypoint slightly west to ensure aircraft would not start the turn until 1.5 NM from the shoreline.

D.2.3 RECOMMENDATION 14 ALTERNATIVE 1 VERSION 2- FLY BY TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 1 VERSION 2 – FLY BY TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Draft Design Concept – Version 2
Description:	The concept involves a redesign of the PADRZ TWO SID using the same initial heading to a fly by waypoint, ANAC14-1, located at two NM from the shoreline, then to a new waypoint located due west, then to KERNL waypoint and the remaining waypoints on the PADRZ TWO SID.
Intent:	Revise PADRZ SID or create a new procedure to reduce noise in the La Jolla and Pacific Beach areas.
Version Notes:	This is the second version of the alternative



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), existing procedure routes (white, final approach (red) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., August 2018 (proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☒ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence ☐ ANAC Intent ☐ Charting Requirements ☐ Design Criteria ☐ Duplicate ANAC #

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility ☐ Safety

Design Notes:

- Ensures turns after initial heading do not occur prior to 1.5 NM from shoreline
- Aircraft start turn at 1.5 NM from shoreline just prior to waypoint and flies just south of waypoint to join next course
- Keeps nighttime departures further south of La Jolla
- Increases flight distance approximately 1.5 NM as compared to PADRZ departures at night
- Compatible with proposed ANAC Recommendation 15 Nighttime Alternative 2 Version 2 design concept

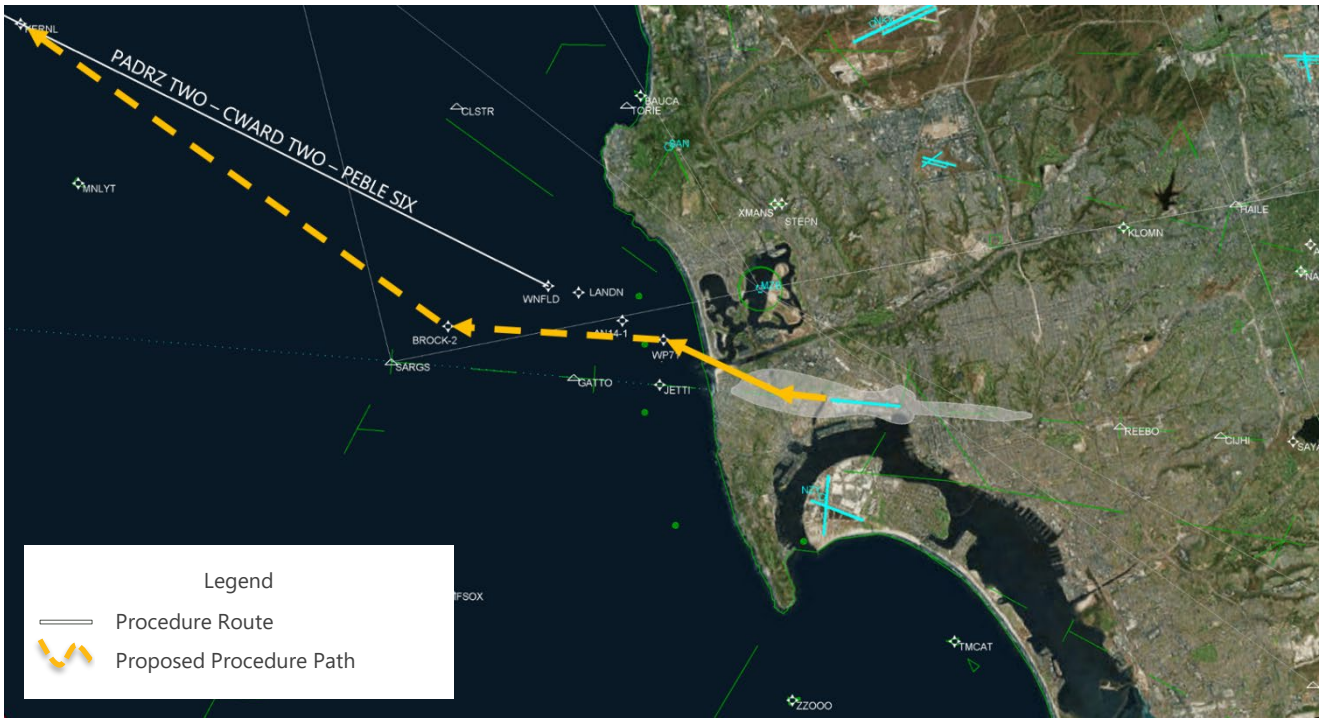
Summary Narrative:

Recommendation 14 Alternative 1 Version 2 is a modification of the PADRZ TWO SID to include a left turn to the west to keep aircraft further south of La Jolla area during nighttime hours. The design uses the same initial heading and RNAV coding that is used for current PADRZ TWO SID to a new fly by waypoint, ANAC-14-1, located along the initial heading at two NM from the shoreline, then to BROCK2, then back to KERNL and the remaining waypoints on the PADRZ TWO SID. The design has been modified to ensure aircraft do not turn prior to the established noise dots located 1.5 NM from the shoreline. The design allows for predictable flight tracks that are designed to stay south of ANAC14-1.

The design meets the intent of ANAC Noise Recommendation 14 and FAA criteria, and is compliant with the current restrictions used by SCT TRACON for departures and missed approaches. Therefore, it was recommended to be passed on to the final phase of the project.

D.2.4 RECOMMENDATION 14 ALTERNATIVE 4 - FLY BY TURN BETWEEN SHORELINE AND 1.5 NM (NIGHTTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 4 – FLY BY TURN BETWEEN SHORELINE AND 1.5 NM (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Draft Design Concept – Version 1
Description:	The concept involves a redesign of the PADRZ TWO SID using the same initial heading to a fly by waypoint located between 0.5 to 1.0 NM from the shore, then to a new waypoint located due west, then to KERNL and the remaining waypoints on the PADRZ TWO SID.
Intent:	Revise PADRZ SID or create a new procedure to reduce noise in the La Jolla, Mission Beach, and Pacific Beach areas.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), existing procedure routes (white, final approach (red) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., August 2018 (proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☒ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence ☐ ANAC Intent ☐ Charting Requirements ☐ Design Criteria ☐ Duplicate ANAC #

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility ☐ Safety

Design Notes:

- Keeps nighttime departures further south of La Jolla without affecting initial departure path predictability
- Increases flight distance approximately 0.75 NM as compared to PADRZ SID departures at night
- Compatible with proposed ANAC Recommendation 15 Nighttime Alternative 4 design concept

Summary Narrative:

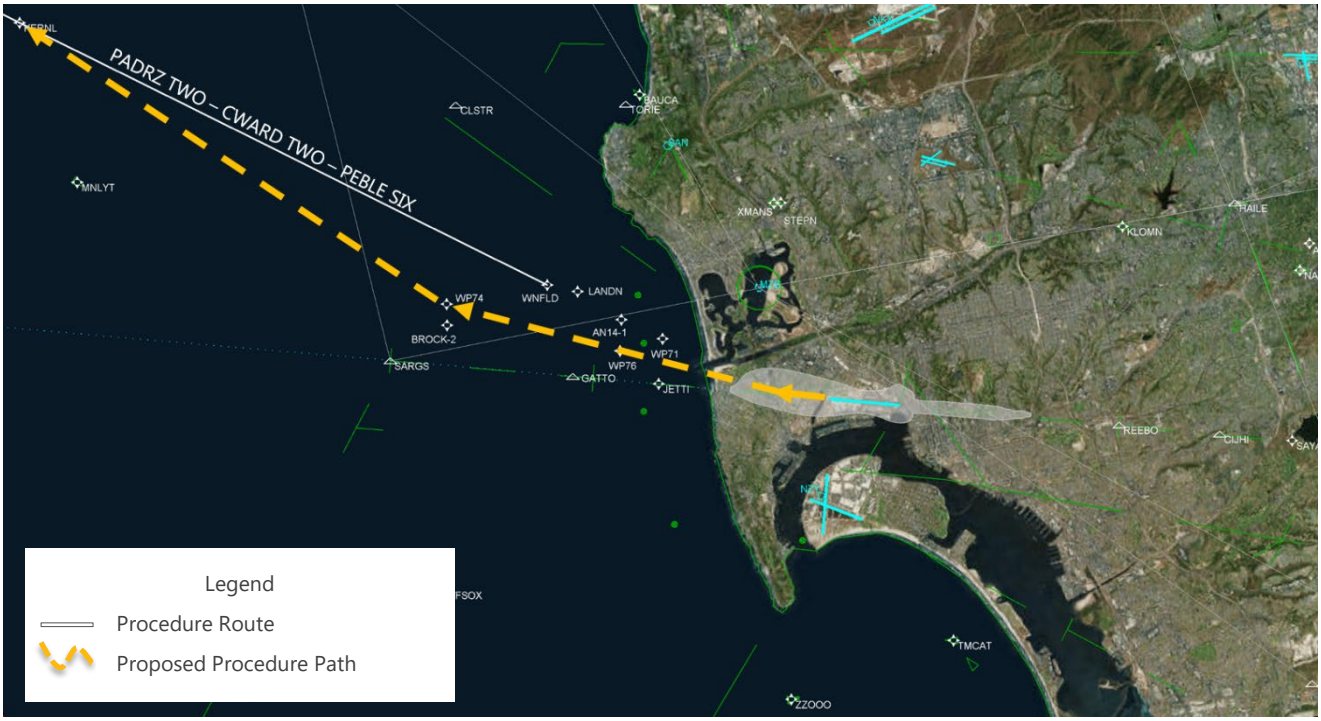
Recommendation 14 Alternative 4 is a modification of the PADRZ TWO SID to include a left turn to the west to keep aircraft further south of the La Jolla area during nighttime hours. It was introduced in the Draft Concept Design phase of the project due to the elimination of Recommendation 14 Alternatives 2 and 3 and based on CAC request to evaluate a design that can turn aircraft west as soon as possible. This design requires the 1.5 NM shoreline agreement would not apply (note: Noise Dots 4 and 5 would still be applicable).

Recommendation 14 Alternative 4 design includes an early turn beyond the shoreline but prior to 1.5 NM in attempt to identify the earliest location an aircraft may turn west within FAA RNAV design criteria, meeting the TARGETS flyability assessment, and without affecting the CNEL 65 noise exposure area. The design uses the same initial heading and RNAV coding that is used for the current PADRZ TWO SID to a new fly by waypoint, WP71, located along the initial heading at one NM from the shoreline, then to BROCK2, then back to KERNL and the remaining waypoints on the PADRZ TWO SID.

The design meets the intent of ANAC Noise Recommendation 14. The design is not consistent with the current early turn restrictions used by SCT TRACON for departures. A change would be required in the SCT TRACON Standard Operating Procedure (SOP) to eliminate the 1.5 NM turn restriction if this alternative is pursued. The alternative was recommended to be passed on to the final phase of the project for noise analysis. CAC indicated concerns related to potential noise increase for the Mission Bay area.

D.2.5 RECOMMENDATION 14 ALTERNATIVE 5 - ELSO (285-DEGREE HEADING) TO FLY BY TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 5 – ELSO TO FLY BY TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Draft Design Concept – Version 1
Description:	The concept involves a redesign of the PADRZ TWO SID using a Vector to an Intercept leg and a heading of 285 degrees to a new waypoint located two NM from the shoreline, then BROCK2, then to KERNL and the remaining waypoints on the PADRZ TWO SID.
Intent:	Revise PADRZ SID or create a new procedure to reduce noise in the La Jolla and Pacific Beach areas.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), existing procedure routes (white, final approach (red) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., August 2018 (proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☒ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence ☐ ANAC Intent ☐ Charting Requirements ☐ Design Criteria ☐ Duplicate ANAC #

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility ☐ Safety

Design Notes:

- Ensures turns after initial heading do not occur prior to 1.5 NM from shoreline
- Moves noise further south closer to Ocean Beach community and has high potential to effect CNEL 65 or higher area
- Keeps nighttime departures further south of La Jolla
- Increases flight distance approximately 0.5 NM compared to PADRZ departures at night
- Compatible with proposed ANAC Recommendation 15 Nighttime Alternative 5 design concept

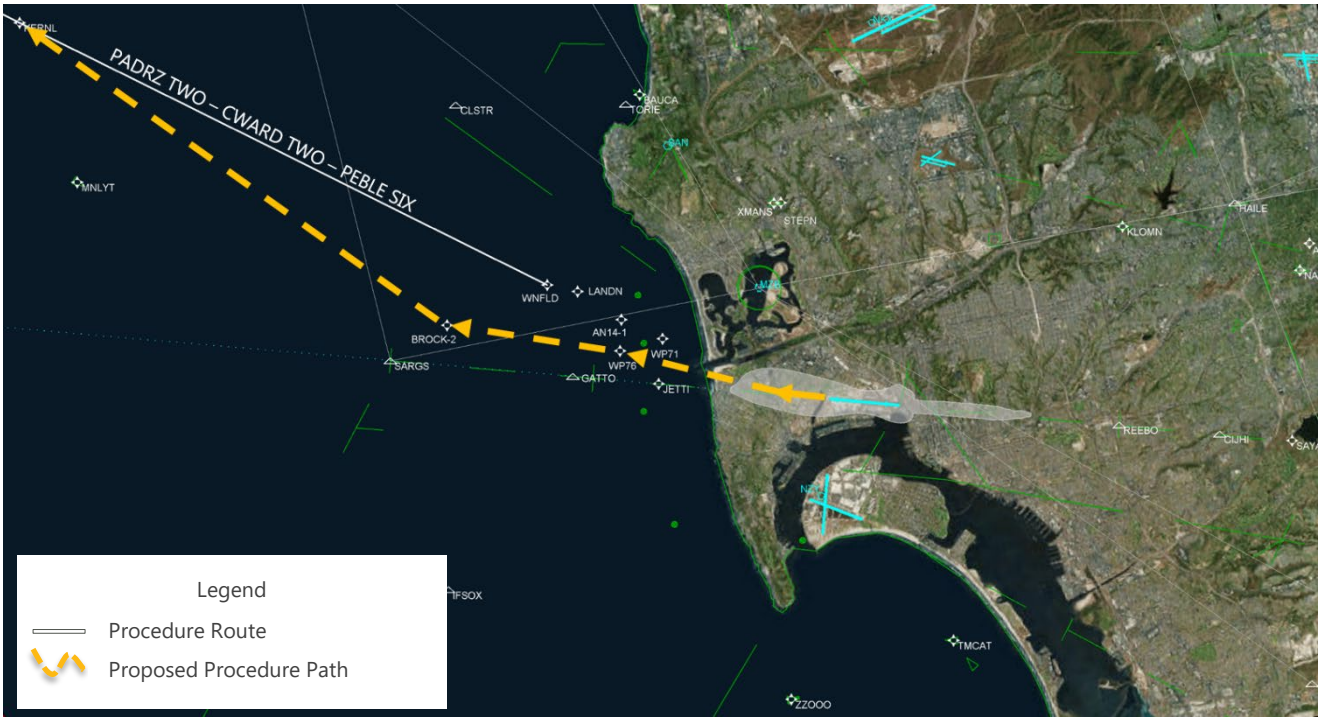
Summary Narrative:

Recommendation 14 Alternative 5 was introduced in the Draft Design Concept phase of the project as a result of TAC and CAC discussion regarding Equivalent Lateral Spacing Operations (ELSO) and criteria found in FAA Order 7110.65X – Divergent Heading for Successive Departures, which allows for a 10-degree heading from runway end to diverge from aircraft on another heading. The procedure is a modification of the PADRZ TWO SID to include a left turn to the west to keep aircraft further south of the La Jolla area. The design uses a 285-degree initial heading enabled by the ELSO criteria versus the current PADRZ SID initial heading as published today. Once established on the 285-degree heading, aircraft will fly to a new fly by waypoint located along the initial heading at 2 NM from the shoreline, then to BROCK2, then back to KERNL and the remaining waypoints on the PADRZ TWO SID.

The design meets the intent of ANAC Noise Recommendation 14 and is compliant with current SCT TRACON early turn restrictions in place today for departures. The ground track of the initial departure segment is new and includes a high potential to change the CNEL 65 noise contour exposure area. Because this measure could change the CNEL 65, it was considered outside of the project scope but should be studied as part of the 14 CFR FAR Part 150 Study (Part 150) among other proposed initial departure heading suggestions. Therefore, this alternative was recommended to be passed to the Part 150 project.

D.2.6 RECOMMENDATION 14 ALTERNATIVE 6 - ELSO (285-DEGREE HEADING) (DAYTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 6 –ELSO (DAYTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Daytime (6:31 a.m. to 9:59 p.m.) Departures
Version:	Draft Design Concept – Version 1
Description:	The concept involves a redesign of the PADRZ TWO SID using a Vector to an Intercept leg and an initial heading of 285 degrees to a new waypoint aligned with BROCK2, then to KERNL and the remaining waypoints on the PADRZ TWO SID.
Intent:	Revise PADRZ SID or create a new procedure to reduce noise in the La Jolla, Mission Beach, and Pacific Beach areas.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), existing procedure routes (white, final approach (red) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., August 2018 (proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☒ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence ☐ ANAC Intent ☐ Charting Requirements ☐ Design Criteria ☐ Duplicate ANAC #

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility ☐ Safety

Design Notes:

- Keeps daytime departures further south of La Jolla
- Moves noise further south closer to Ocean Beach community and has high potential to effect CNEL 65 or higher area
- Increases flight distance approximately 0.4 NM compared to PADRZ departures
- Compatible with ZZOOO SID and Recommendation 15 Alternative 1

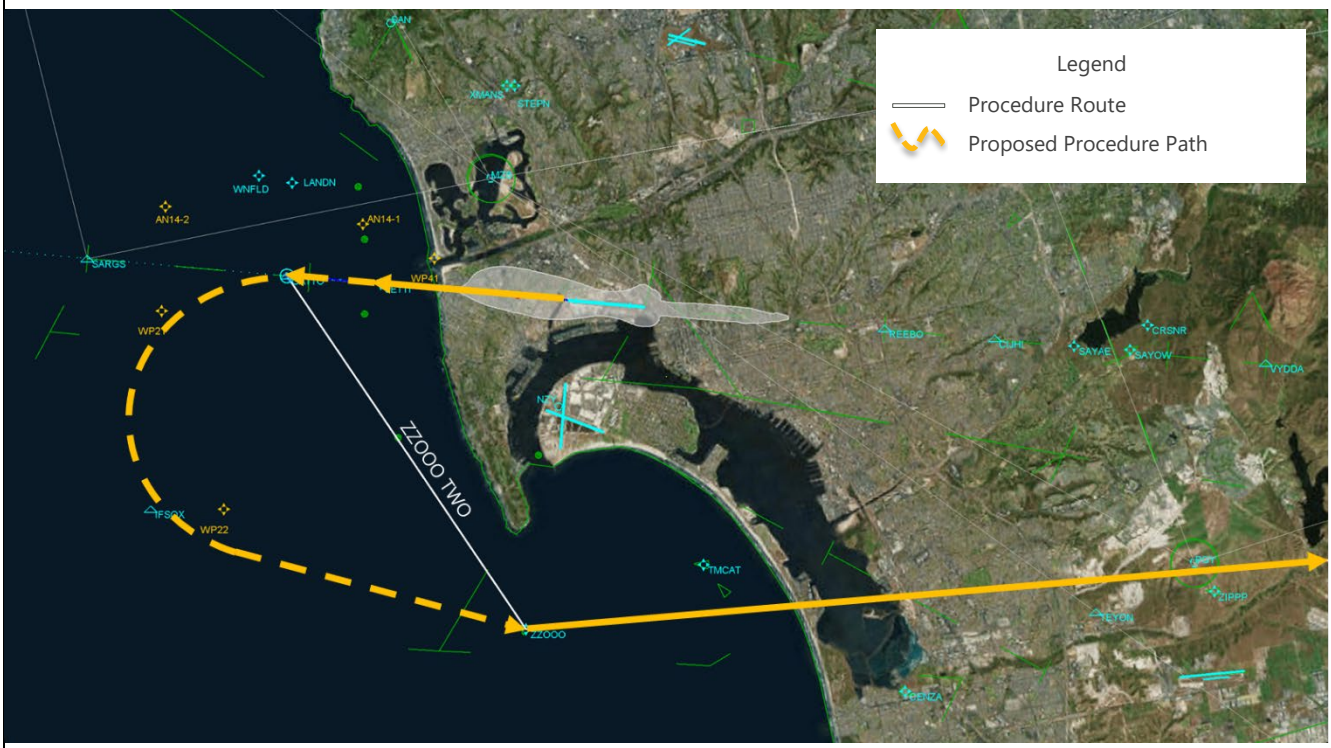
Summary Narrative:

Recommendation 14 Alternative 6 was introduced in the Draft Design Concept phase of the project as a result of TAC and CAC discussion regarding Equivalent Lateral Spacing Operations (ELSO) and criteria found in FAA Order 7110.65X – Divergent Heading for Successive Departures, allowing for a 10-degree heading from runway end to diverge from aircraft on another heading. The procedure, for daytime use, is a modification of the PADRZ TWO SID to include a left turn to the west to keep aircraft further south of the La Jolla area. The design uses a 285-degree initial heading enabled by the ELSO criteria versus the current PADRZ SID initial heading as published today. Once established on the 285-degree heading, aircraft will fly to a new fly over waypoint located slightly north of BROCK2, then back to KERNL and the remaining waypoints on the PADRZ TWO SID. This design allows for successive departure on Runway 27 with the ZZOOO TWO, and ANAC 15 Alternative 1 procedure for daytime operations.

The design meets the intent of Recommendation 14 and is not compliant with current SCT TRACON early turn restrictions in place today for departures. The ground track of the initial departure segment is new and has strong potential to change the CNEL 65 noise exposure area. Because this measure would change the CNEL 65, it was considered outside of the project scope and should be studied as part of the 14 CFR Part 150 Study (Part 150). Therefore, this alternative was recommended to be passed to the Part 150 project.

D.2.7 RECOMMENDATION 15 ALTERNATIVE 1 - EXTEND JETTI WAYPOINT 2 NM WEST (DAYTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 1 – EXTEND JETTI 2NM WEST (DAYTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Daytime (6:30 a.m. to 9:59 p.m.) Departure
Version:	Draft Design Concept – Version 1
Description:	The concept involves a modification of the ZZOOO TWO SID where the JETTI waypoint is moved two NM further west of its current location.
Intent:	Revise the ZZOOO SID to move departures further west of the Point Loma shoreline, reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to cross over ZZOOO waypoint at a higher altitude compared to current conditions.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure route (white), proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☒ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence ☐ ANAC Intent ☐ Charting Requirements ☐ Design Criteria ☐ Duplicate ANAC #

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility ☐ Safety

Design Notes:

- Meets required minimum distance between JETTI and ZZOOO waypoints – no waiver required
- Maintains all existing En Route transitions after ZZOOO waypoint
- Increase flight distance should increase frequency of aircraft over 8,000 feet MSL near ZZOOO waypoint (from 85% to over 95%)
- Moves dispersion of traffic further west from Point Loma
- Would increase flight distance by 2.95 NM compared to existing ZZOOO SID
- Radar vector may still occur

Summary Narrative:

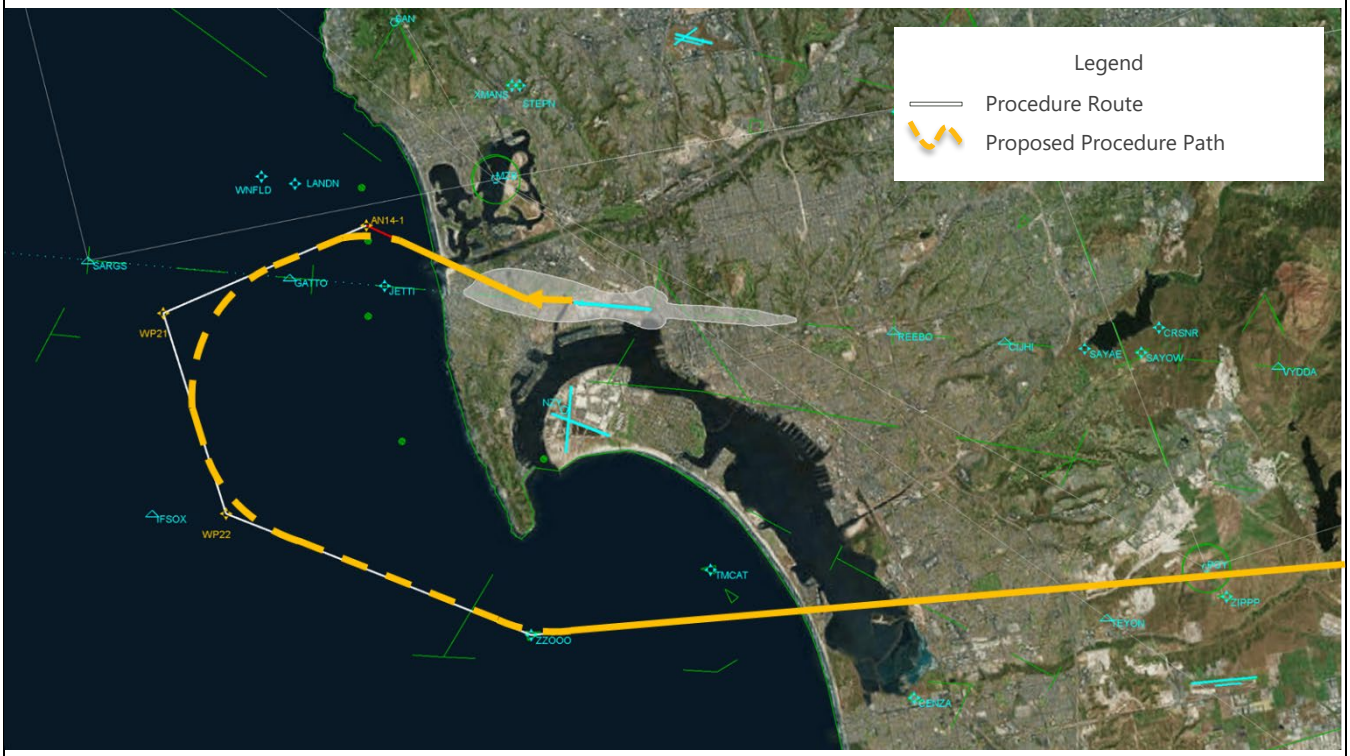
Recommendation 15 Alternative 1 is designed to shift the JETTI waypoint further west with intent of keeping aircraft further west from the Point Loma shoreline and to provide more flight track distance for aircraft to climb to achieve 8,000 feet at the ZZOOO waypoint. This alternative was also designed to remove the current speed restriction on the ZZOOO TWO required to ensure aircraft flyability from JETTI to ZZOOO. No changes were made to the design compared to the version evaluated under the Preliminary Draft Design Concept phase.

Some airline representatives in the TAC suggested the removal of the speed restriction may reduce the height of aircraft as they pass near the ZZOOO waypoint. Additional analysis was conducted to verify the altitudes near the ZZOOO waypoint using the 230 knot restriction and those without the restriction are similar. Further analysis conducted indicated the reason for the speed restriction was for aircraft flyability purposes related to the current ZZOOO procedure design between JETTI and ZZOOO waypoint. The design for Alternative 1 increases the distance between the two waypoints that no longer requires the speed restriction at the JETTI waypoint.

The procedure design meets FAA criteria and passes the flyability assessment, and the intent of the recommendation. Therefore, it was recommended to be passed to the final phase of the project.

D.2.8 RECOMMENDATION 15 ALTERNATIVE 2 - FLY BY TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 2 – FLY BY TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Draft Design Concept – Version 1
Description:	The concept involves the development of a new SID using the initial heading design of the PADRZ TWO SID to a fly by waypoint located 1.5 NM from the shoreline, then to a new fly by waypoint, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.
Intent:	Revise the ZZOOO SID to significantly reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to reduce east bound turns over La Jolla.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure route (white), proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft	☐ Pass to Final	☐ Pass to Next Steps
☐ Pass to Part 150	☒ Eliminate	

Reason for Elimination:

☐ 65 CNEL Influence	☒ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Aircraft would turn left after initial heading at a fly by waypoint 1.5 NM west of the shoreline
- Fly by waypoint and Track to Fix leg design keeps nighttime departures further west of Point Loma and increases altitude near the ZZOOO waypoint
- Similar flight distance as compared to existing radar vector departures at night
- Compatible with proposed ANAC Recommendation 14 Alternative 1 Version 1 nighttime design concept with fly by waypoint
- Not compatible with proposed ANAC Recommendation 14 Alternative 1 nighttime design concept with fly over waypoint due to different turn paths caused by a fly over versus fly by design– would create a safety risk to potential converging traffic with aircraft on Recommendation 14 Alternative 1 fly over turn
- Maintains all existing En Route transitions currently used as part of the ZZOOO TWO SID
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Summary Narrative:

Recommendation 15 Alternative 2 is predicated on the establishment of a new RNAV procedure for nighttime departures to the south and east when the Air Traffic Control Tower directs all jet departures to turn right after 10:00 p.m. Currently, this is a radar vector only operation. The design of the procedure uses initial heading of the PADRZ TWO SID to a fly by waypoint, ANAC-14, located 1.5 NM from the shoreline. This is the same waypoint as used in Recommendation 14 Alternative 1 fly by design. Aircraft will then track to a new fly by waypoint located west of JETTI, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.

Further analysis was conducted as part of the Draft Design Concept phase of the project. The design meets the intent of Recommendation 14 and is compliant with the current early turn restrictions used by SCT TRACON for departures and missed approaches. However, through discussions with TAC and CAC, there was a concern that aircraft would turn west prior to the established noise dots located 1.5 NM miles from the shoreline due to the Distance Turn Anticipation (DTA) associated with the fly by waypoint. As a result, this design was recommended to be eliminated and replaced with Recommendation 15 Alternative 2 Version 2.

D.2.9 RECOMMENDATION 15 ALTERNATIVE 2 VERSION 2 - FLY BY TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 2 VERSION 2– FLY BY WAYPOINT 1.5 NM FROM SHORE THEN TO ZZOOO (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Draft Design Concept – Version 2
Description:	The concept involves the development of a new SID using the initial heading design of the PADRZ TWO SID to a fly by waypoint located two NM from the shoreline, then to a new fly by waypoint, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.
Intent:	Revise the ZZOOO SID to significantly reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to reduce east bound turns over La Jolla.
Version Notes:	This is the Version 2 of the alternative.

Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., August 2018 (proposed procedure route (white), proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft	☒ Pass to Final	☐ Pass to Next Steps
☐ Pass to Part 150	☐ Eliminate	

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Ensures turns after initial heading do not occur prior to 1.5 NM from shoreline
- Aircraft start turn at 1.5 NM from shoreline just prior to waypoint and flies just south of waypoint to join next course
- Keeps nighttime departures further west of Point Loma and increases frequency of aircraft at or above 8,000 feet MSL near ZZOOO waypoint
- Compatible with proposed ANAC Recommendation 14 Alternative 1 fly by nighttime design concept
- Not compatible with proposed ANAC Recommendation 14 Alternative 1 nighttime design concept with fly over waypoint due to different turn paths caused by a fly over versus fly by design– would create a safety risk to potential converging traffic with aircraft on Recommendation 14 Alternative 1 fly over turn
- Maintains routes after ZZOOO waypoint
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

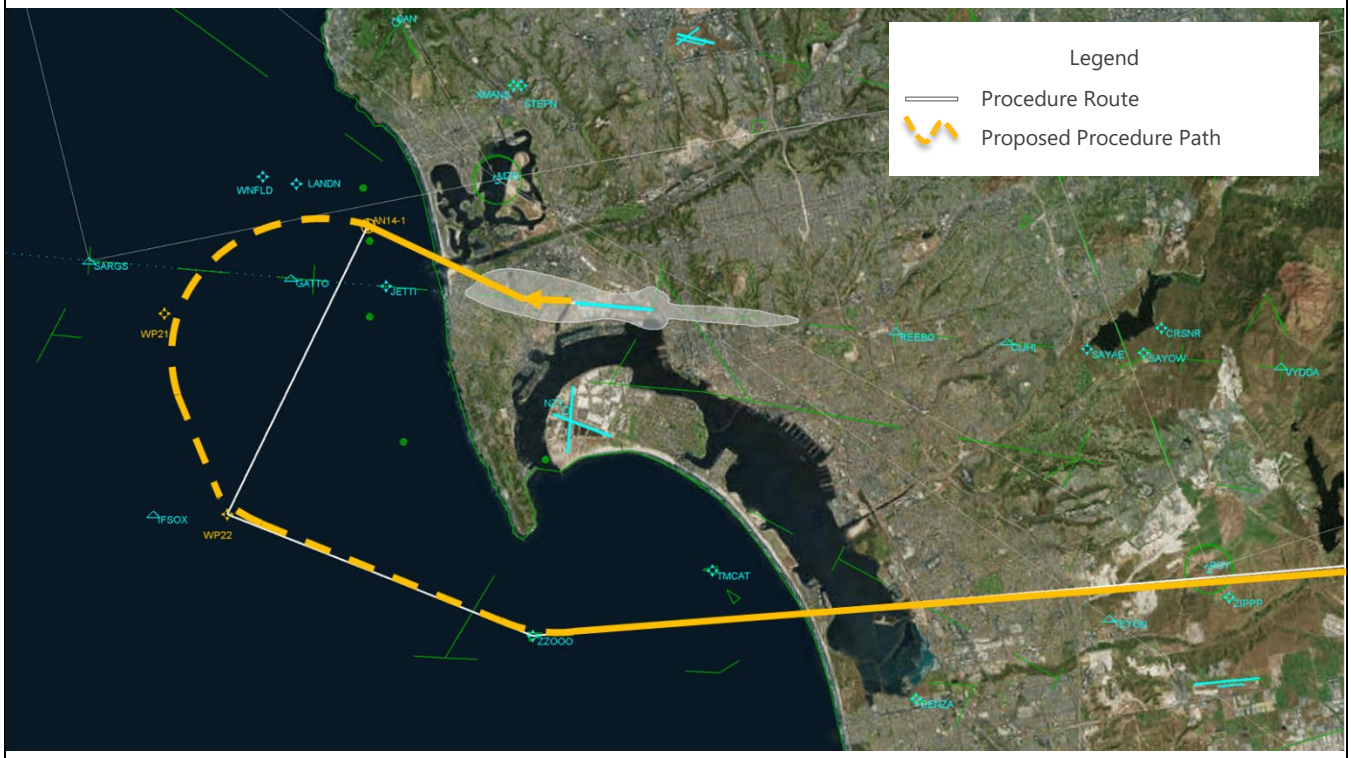
Summary Narrative:

The design of Recommendation 15 Alternative 2 Version 2 is predicated on the establishment of a new RNAV procedure for nighttime departures to the south and east. Currently, this is a vector only operation. The design of the procedure uses initial heading of the PADRZ TWO SID to a fly by waypoint, ANAC-14 located two NM from the shoreline versus the 1.5 NM location of the Version 1 design. This is the same waypoint as used in Recommendation 14 Alternative 1 Version 2 Fly By design. Aircraft will then track to a new fly by waypoint located west of JETTI, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.

The design meets the intent of Recommendation 15, is compatible with Recommendation 14 Alternative 1 Version 2, meets FAA design criteria, and is compliant with the current early turn restrictions used by SCT TRACON for departures and missed approaches. Therefore, it was recommended to be passed on to the final phase of the project.

D.2.10 RECOMMENDATION 15 ALTERNATIVE 3 - FLY OVER TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 3 – FLY OVER TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Draft Design Concept – Version 1
Description:	The concept involves the development of a new SID using the initial heading design of the PADRZ TWO SID to a fly over waypoint located 1.5 NM from the shoreline, then to a series of fly by waypoint to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.
Intent:	Revise the ZZOOO SID to significantly reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to reduce east bound turns over La Jolla.
Version Notes:	This is the initial version of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., May 2018 (proposed procedure route (white), proposed procedure path and waypoints (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence	☒ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☒ Safety

Design Notes:

- Aircraft turn left after passing over waypoint located at 1.5 NM from shoreline
- Keeps nighttime departures further west of Point Loma, but closer to La Jolla compared to using a fly by waypoint.
- Expected to increase frequency of aircraft at or over 8,000 feet MSL near ZZOOO waypoint,
- Not feasible with proposed ANAC Recommendation 14 nighttime design concepts with fly by waypoint due to potential loss of safe separation with following aircraft on proposed northbound SID as lead aircraft turns south towards ZZOOO waypoint
- Maintains all existing routes after ZZOOO waypoint
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Summary Narrative:

The design of Recommendation 15 Alternative 3 is predicated on the establishment of a new RNAV procedure for nighttime departures to the south and east. Currently, this is a vector only operation. The design of the procedure uses the same initial heading design of the PADRZ TWO SID to a fly over waypoint, ANAC-14 located 1.5 NM from the shoreline. This is the same waypoint as used in the Recommendation 14 Alternative 1 fly over design. Aircraft will then track to a new fly by waypoint located west of JETTI, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.

The procedure design meets intent of the recommendation and passes the flyability assessment. However, according to FAA criteria, a fly over waypoint should only be used when operationally necessary. Second, a fly over waypoint design for eastbound departures and a fly by waypoint design for northbound departures is not compatible due to potential loss of safe separation with following aircraft on proposed northbound SID as lead aircraft heading east turns south towards ZZOOO waypoint. Third, the use of a fly over waypoint on this procedure will cause aircraft traffic patterns turning west to be unpredictable and track closer to La Jolla compared to a fly by waypoint design. At the August 30, 2018 CAC and TAC meetings, TAC and CAC indicated a preference to the fly by design as a means to best meet the intent of Recommendation 14 compared to the fly over design. Therefore, this procedure was recommended to be eliminated from further consideration based on the potential safety risks associated with the incompatibility between a fly over design for eastbound departures and a fly by design for northbound departures and employing the CAC preferred fly by design that best meets the intent of Recommendation 14 to keep northbound departures further south of the La Jolla area. This design concept was recommended to be eliminated from further consideration.

D.2.11 RECOMMENDATION 15 ALTERNATIVE 4 - FLY BY TURN BETWEEN SHORELINE AND 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 4 – FLY BY TURN BETWEEN SHORELINE AND 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Draft Design Concept – Version 1
Description:	The concept involves the development of a new SID using the same initial heading design of the PADRZ TWO SID to a fly over waypoint located one NM from the shoreline, then to a new fly by waypoint, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.
Intent:	Revise the ZZOOO SID to significantly reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to reduce east bound turns over La Jolla.
Version Notes:	This is the initial version of the alternative.

Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (white), runways (cyan), and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., August 2018 (proposed procedure route (white), proposed procedure path (orange) and waypoints (white)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☒ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Aircraft would turn left approximately 0.5 NM west of the shoreline
- Compatible with Recommendation 14 Alternative 4 with same fly by waypoint location
- Keeps nighttime departures further west of Point Loma
- Expected to increase frequency of aircraft at or above 8,000 feet MSL near ZZOOO waypoint, but not as much as Recommendation 15 Alternative 2 due to shorter flight distance
- Maintains all existing routes after ZZOOO waypoint
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Summary Narrative:

The design of Recommendation 15 Alternative 4 is predicated on the establishment of a new RNAV procedure for nighttime departures to the south and east. Currently, this is a vector only operation. Recommendation 15 Alternative 4 design includes an early turn beyond the shoreline but prior to 1.5 NM in attempt to identify the earliest location an aircraft may turn west within FAA RNAV design criteria, meeting the TARGETS flyability assessment, and without affecting the CNEL 65 noise exposure area. This was designed to provide an eastbound departure procedure that is compatible with Recommendation 14 Alternative 4. The design uses the same initial heading and RNAV coding that is used for the current PADRZ TWO SID to a new fly by waypoint, WP71, located along the initial heading at one NM from the shoreline. The fly by waypoint is the same waypoint used in Recommendation 14 Alternative 4 to ensure compatibility between the two designs. Aircraft will then track to a new fly by waypoint located west of JETTI, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.

The design meets the intent of ANAC Noise Recommendation 15. The design is not consistent with the current early turn restrictions used by SCT TRACON for departures. A change would be required in the SCT TRACON SOP to eliminate the 1.5 NM turn restriction if this alternative is pursued. The alternative was recommended to be passed on to the final phase of the project for noise analysis. CAC indicated concerns related to potential noise increase for the Mission Bay area.

D.2.12 RECOMMENDATION 15 ALTERNATIVE 5 - ELSO (285-DEGREE HEADING) TO FLY BY TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 5 – ELSO TO FLY BY TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Draft Design Concept – Version 1
Description:	The concept involves a redesign of the PADRZ TWO SID using a Vector to an Intercept leg and a heading of 285 degrees to a new waypoint located two NM from the shoreline, then south via two new fly by waypoints, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.
Intent:	Revise the ZZOOO SID to significantly reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to reduce east bound turns over La Jolla.
Version Notes:	This is the initial version of the alternative.

Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (white), runways (cyan), and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., August 2018 (proposed procedure route (white), proposed procedure path (orange) and waypoints (white)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☒ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☒ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Ensures turns after initial heading do not occur prior to 1.5 NM from shoreline
- Moves noise further south closer to Ocean Beach community and has high potential to effect CNEL 65 or higher area
- Compatible with Recommendation 14 Alternative 5 with same fly by waypoint location
- Keeps nighttime departures further west of Point Loma and increases frequency of aircraft at or over 8,000 feet near ZZOOO waypoint compared to existing radar vector procedure
- Maintains all existing routes after ZZOOO waypoint
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Summary Narrative:

Recommendation 15 Alternative 5 was introduced in the Draft Design Concept phase of the project as a result of TAC discussion regarding Equivalent Lateral Spacing Operations (ELSO) and criteria found in FAA Order 7110.65X – Divergent Heading for Successive Departures, allowing for a 10-degree heading from runway end to diverge from aircraft on another heading. The procedure is a new SID for eastbound nighttime departures that keep aircraft further west and stay south of Point Loma and is compatible with Recommendation 14 Alternative 5, which was designed to keep nighttime departures further south of La Jolla. The design uses a 285-degree initial heading enabled by the ELSO criteria versus the current initial heading as published today. Once established on the 285-degree heading, aircraft will fly to a new fly by waypoint located along the initial heading at two NM from the shoreline, then to two new fly by waypoints to ZZOOO and the remaining waypoints on the ZZOOO TWO SID. This design allows for successive departure on Runway 27 with the ANAC 14 Alternative 5 procedure for nighttime operations.

The design meets the intent of Recommendation 15 and is compliant with current SCT TRACON early turn restrictions in place today for departures. The ground track of the initial departure segment is new and has strong potential to change the CNEL 65 noise exposure area. Because this measure would change the CNEL 65, it was considered outside of the project scope and should be studied as part of the 14 CFR Part 150 Study (Part 150). Therefore, this alternative was recommended to be passed to the Part 150 project.

D.2.13 RECOMMENDATION 16 ALTERNATIVE 1 VERSION 2 - CROSS LNTRN WAYPOINT AT 10,000 FT. TO I805/SR52 AT 8,000 FT. TO KLOMN WAYPOINT AT 6,000 FT.

ANAC RECOMMENDATION:	16 ALTERNATIVE 1 VERSION 2 – CROSS LNTRN AT 10,000 FT. TO I805/SR52 AT 8,000 FT. TO KLOMN AT 6,000 FT.
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Arrivals
Version:	Draft Design Concept – Version 2
Description:	The concept involves the revision of the COMIX STAR with direct routing from LNTRN waypoint to a new fly by waypoint at I805/SR52 to KLOMN waypoint. Aircraft will cross LNTRN at 10,000 feet, I805/SR52 at 8,000 feet, and KLOMN at 6,000 feet.
Intent:	Reassess and revive the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the North into a very narrow corridor over La Jolla area.
Version Notes:	This Version 2 of the alternative.

Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., August 2018 (proposed procedure route (white) and proposed procedure path (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☒ Operational Feasibility	☒ Safety

Design Notes:

- Design includes proposed waypoint at I-805 and SR-52
- Due to elimination of longer downwind pattern, may cause FAA ATC vectoring off procedure to manage traffic into final approach and/or airlines inability to descent and reduce speed as requested by FAA ATC
- Possible ATC issues with MCAS Miramar
- Moves noise from one community to another - may be deemed infeasible by FAA due to environmental concerns
- Maintains all existing routes up to LNTRN waypoint
- Reduces the flight track by one NM

Summary Narrative:

Recommendation 16 Alternative 1 Version 2 was introduced in the Draft Design Concept phase as a result of the discussions with TAC and CAC regarding historical flight tracks in the area and the fact that the distance from LNTRN to KLOMN is adequate to comply with descent gradient requirements (not factoring speed adjustments) if aircraft cross LNTRN waypoint at 10,000 feet MSL. The CAC desired further development of the alternative.

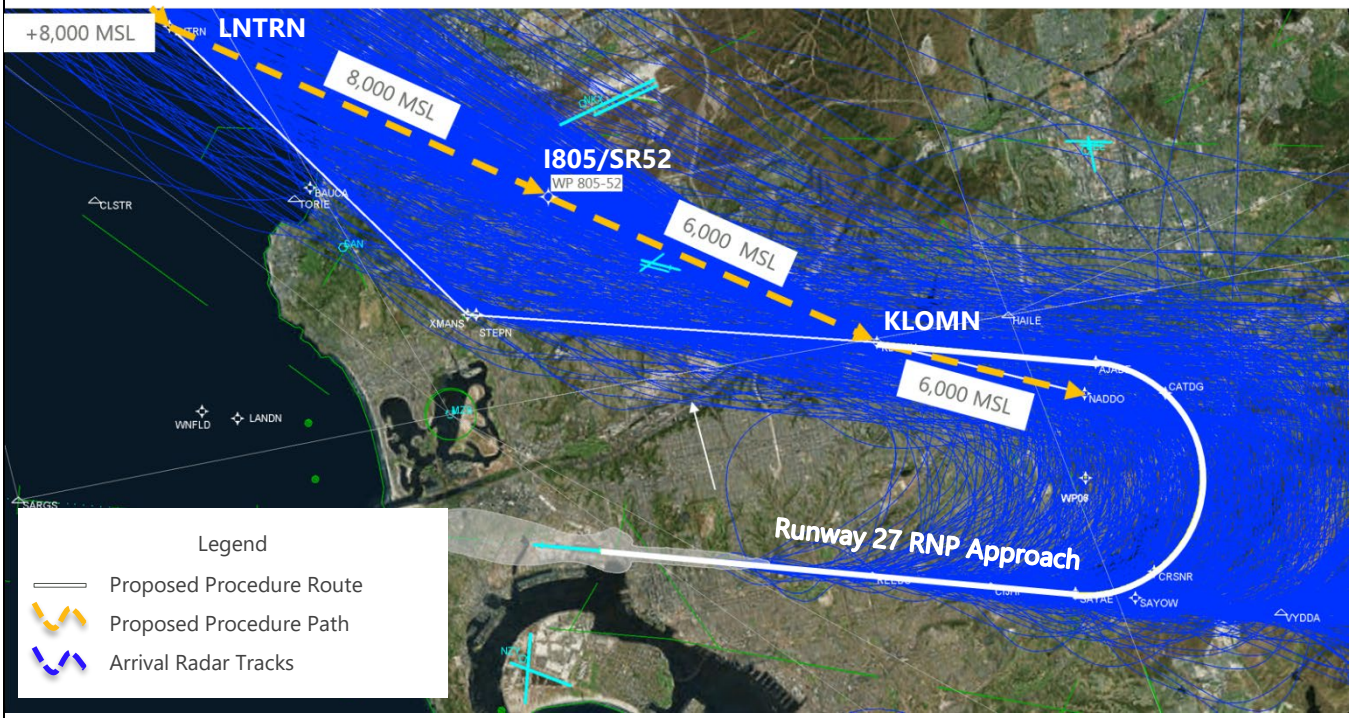
The new design includes a crossing altitude at LNTRN waypoint at 10,000 MSL but requires a redesign of all the altitudes on COMIX TWO STAR from the COMIX waypoint to LNTRN. The procedure complies with FAA criteria and the TARGETS flyability assessment tool. However, several comments were received from airline representatives at the August 30, 2018 TAC meeting indicating their aircraft are unable to meet the altitude restrictions associated with the current COMIX TWO STAR (LNTRN at 9,000) and that they would not be able to meet the restrictions if LNTRN was raised to 10,000 feet MSL. Pilots would have to use all means available to descend and slow down to comply with the altitude requirements. This includes the use of speed brakes (flaps on the top of the wings that extend up to slow aircraft speed), which is considered the last available measure for pilots to slow an aircraft down. The likelihood of non-compliance is high, which would require the pilot to inform ATC and cause additional workload for both the pilot and the controller. Frequent non-compliance due to the procedure design may also be considered a safety risk by the FAA.

As in the case of preliminary draft versions for Recommendation 16, the new route significantly changes the flight track for the arrival resulting in a shift in noise from one community to another. The new route also reduces the sequencing and spacing area available to SCT for arrivals and places traffic within the MCAS Miramar airspace where possible conflicts may occur.

CAC members requested Version 2 proceed to noise modeling to for evaluation. However, due to the aircraft performance issues and inability to comply with the proposed procedure identified by the airlines, it was eliminated from further consideration. CAC requested an evaluation of the design with an 8,000 feet MSL crossing altitude over LNTRN waypoint (refer to Version 3).

D.2.14 RECOMMENDATION 16 ALTERNATIVE 1 VERSION 3 - CROSS LNTRN WAYPOINT AT OR ABOVE 8,000 FT. TO I805/SR52 AT 7,000 FT. TO KLOMN WAYPOINT AT 6,000 FT.

ANAC RECOMMENDATION:	16 ALTERNATIVE 1 VERSION 3 – CROSS LNTRN WAYPOINT AT OR ABOVE 8,000 FT. TO I80/SR72 AT 7,00 FT. TO KLOMN AT 6,000 FT.
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Arrivals
Version:	Draft Design Concept – Version 3
Description:	The concept involves the revision of the COMIX STAR with direct routing from LNTRN to a new fly by waypoint at I805/SR52 to KLOMN. Aircraft will cross LNTRN at or above 8,000 feet, I80/SR72 at 8,000 feet, and KLOMN at 6,000 feet.
Intent:	Reassess and revive the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the North into a very narrow corridor.
Version Notes:	This is Version 3 of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (white), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); San Diego County Regional Airport Authority, May 2017 to December 2017 (radar data (blue)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., August 2018 (proposed procedure route (white), proposed procedure path (orange) and proposed waypoints (white)).

Graphic Reference: Presented to TAC and CAC on October 25, 2018.

Screening Findings:

☐ Pass to Draft ☒ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Design includes proposed waypoint at I-805 and SR-52
- Due to elimination of longer downwind pattern, may cause FAA ATC vectoring off procedure to manage traffic into final approach and/or airlines inability to descent and reduce speed as requested by FAA ATC
- Possible ATC issues with MCAS Miramar
- Moves noise from one community to another - may be deemed infeasible by FAA due to environmental concerns
- Maintains all existing routes up to LNTRN waypoint.
- COMIX crossing altitude window modified to be 12,000 to 14,000
- Reduces the flight track one NM

Summary Narrative:

Recommendation 16 Alternative 1 Version 3 was introduced late in the Draft Design Concept phase in attempt to design a procedure that may be acceptable to the airlines operating at San Diego International Airport and meet ANAC's intended flight path location for Recommendation 16. The design was presented at the October 25, 2018 TAC and CAC meetings. As requested by CAC members, all designs were presented with radar tracks.

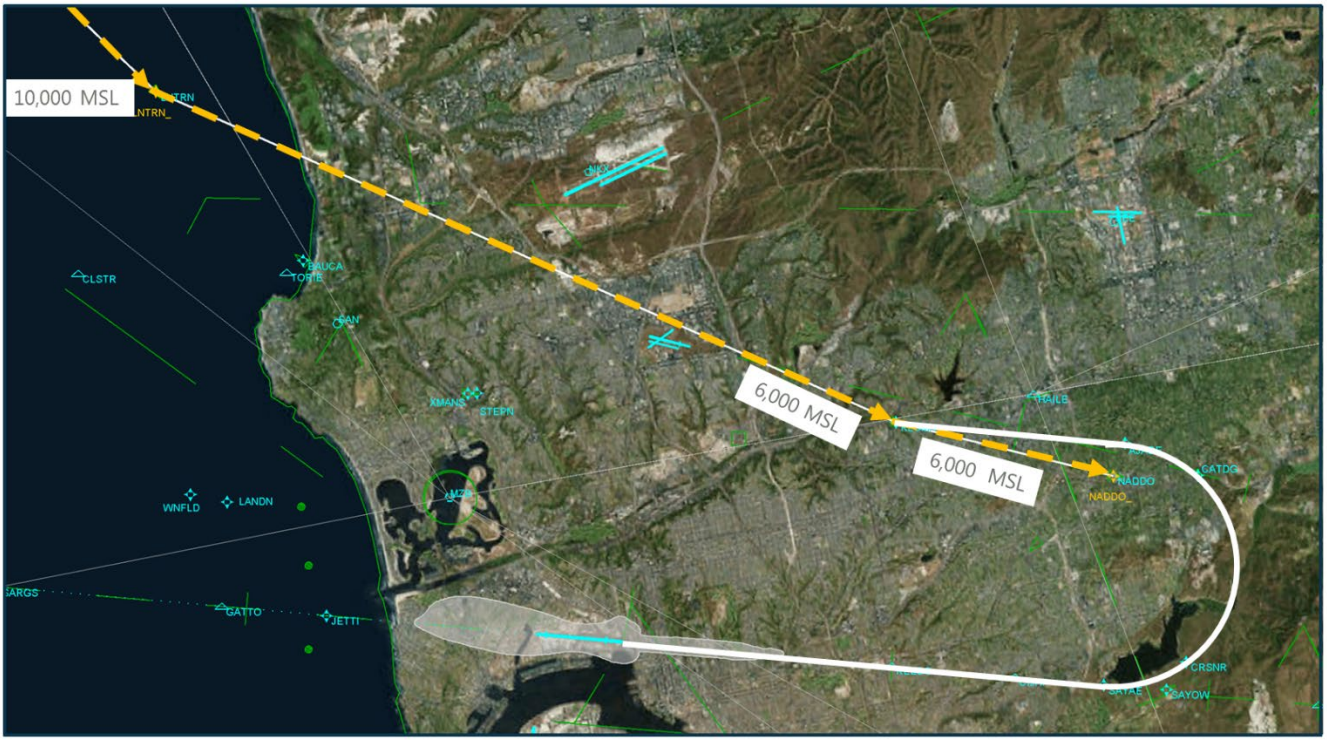
The new design includes a crossing of LNTRN at or above 8,000 MSL and requires a redesign of some of the altitudes on COMIX TWO STAR from the COMIX waypoint to LNTRN. The current COMIX waypoint altitude is a window altitude between 12,000 and 15,000 feet MSL. To pass design criteria, the window altitude over the COMIX waypoint was reduced between 12,000 and 14,000 feet MSL. Based on a cursory review, FAA did not indicate a major concern with the change, but indicated possible concerns related to maintaining an optimized descent as intended in the current procedure. The procedure complies with FAA criteria and the TARGETS flyability assessment tool.

As in the case of previous versions for Recommendation 16 Alternative 1, the new route changes the flight track for the arrival resulting in a shift in noise from one community to another. The new route also reduces the sequencing and spacing area available to SCT TRACON for arrivals and places traffic within the Miramar Marine Corps Air Station Airspace where possible conflicts may occur.

Because the CAC members requested this procedure be screened for noise and the altitudes were adjusted to make the procedure flyable, it was recommended to be passed to the final phase of the project to quantify potential increases in CNEL.

D.2.15 RECOMMENDATION 16 ALTERNATIVE 2 VERSION 2 - CROSS LNTRN WAYPOINT AT 10,000 FT. DIRECT TO KLOMN WAYPOINT AT 6,000 FT.

ANAC RECOMMENDATION:	14 ALTERNATIVE 2 VERSION 2 – CROSS LNTRN WAYPOINT AT 10,000 FT. DIRECT TO KLOMN AT 6,000 FT.
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Arrivals
Version:	Draft Design Concept – Version 2
Description:	The concept involves the revision of the COMIX STAR with direct routing from LNTRN to KLOMN. Aircraft will cross LNTRN at or above 10,000 feet and KLOMN at 6,000 feet.
Intent:	Reassess and revive the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the North into a very narrow corridor.
Version Notes:	This is Version 2 of the alternative.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (cyan), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., August 2018 (proposed procedure route (white) and proposed procedure path (orange)).

Graphic Reference: Presented to TAC and CAC on August 30, 2018.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 CNEL Influence ☒ ANAC Intent ☐ Charting Requirements ☐ Design Criteria ☐ Duplicate ANAC #

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☒ Operational Feasibility ☒ Safety

Design Notes:

- Design attempted to let aircraft descend between LNTRN and KLOMN with no interruption
- Due to elimination of longer downwind pattern, may cause FAA ATC vectoring off procedure to manage traffic into final approach and/or airlines inability to descent and reduce speed as requested by FAA ATC
- Possible ATC issues with MCAS Miramar
- Moves noise from one community to another - may be deemed infeasible by FAA due to environmental concerns
- Maintains all existing routes up to LNTRN waypoint.
- Reduces the flight track one NM

Summary Narrative:

Recommendation 16 Alternative 2 Version 2 was introduced in the Draft Design Concept phase as a result of the discussions with TAC and CAC regarding historical flight tracks in the area and the fact that the distance from LNTRN to KLOMN is adequate to comply with descent gradient requirements (not factoring speed adjustments) if aircraft cross LNTRN waypoint at 10,000 feet MSL. The CAC desired further development of the alternative.

The new design includes a crossing altitude at LNTRN waypoint at 10,000 MSL and proceeds direct to KLOMN at 6,000 feet. It requires a redesign of all the altitudes on COMIX TWO STAR from the COMIX waypoint to LNTRN. The procedure complies with FAA criteria and the TARGETS flyability assessment tool. However, several comments were received from airline representatives at the August 30, 2018 TAC meeting indicating their aircraft are unable to meet the altitude restrictions associated with the current COMIX TWO STAR (LNTRN at 9,000) and that they would not be able to meet the restrictions if LNTRN was raised to 10,000 feet MSL. Pilots would have to use all means available to descend and slow down to comply with the altitude requirements. This includes the use of speed brakes (flaps on the top of the wings that extend up to slow aircraft speed), which is considered the last available measure for pilots to slow an aircraft down. The likelihood of non-compliance is high, which would require the pilot to inform ATC and cause additional workload for both the pilot and the controller. Frequent non-compliance due to the procedure design may also be considered a safety risk by the FAA.

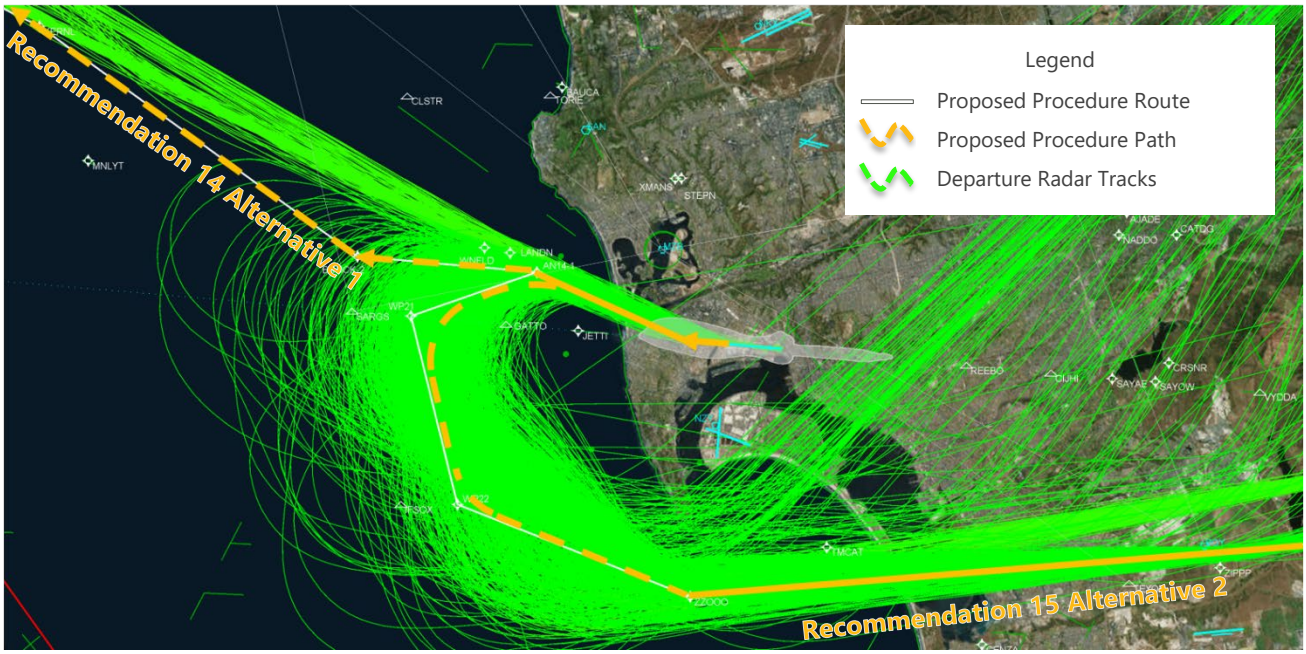
As in the case of preliminary draft versions for Recommendation 16, the new route significantly changes the flight track for the arrival resulting in a shift in noise from one community to another. The new route also reduces the sequencing and spacing area available to SCT for arrivals and places traffic within the MCAS Miramar airspace where possible conflicts may occur.

CAC members preferred Recommendation 16 Alternative 1 Version 2, which included a waypoint near the intersection of I-805 and SR-52. Due to the aircraft performance issues and inability to comply with the proposed procedure identified by the airlines, TAC members were concerned about operation feasibility and safety of the design. Therefore, this alternative design concept was eliminated from further consideration.

D.3 FINAL DESIGN CONCEPT PHASE ALTERNATIVES

D.3.1 RECOMMENDATION 14 ALTERNATIVE 1 - FLY BY TURN AT 1.5 NM FROM SHORELINE (NIGHTTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 1 VERSION 2 – TURN AT 1.5 NM WITH FLY BY WAYPOINT
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Final Design Concept – Version 2
Description:	The concept involves a redesign of the PADRZ TWO SID using the same initial heading to a fly by waypoint, ANAC14-1, located at 2.0 nautical miles from the shore, then to a new waypoint located due west, then to KERNL and the remaining waypoints on the PADRZ TWO SID.
Intent:	Revise PADRZ SID or create a new procedure to reduce noise in the La Jolla, Mission Beach, and Pacific Beach areas.
Version Notes:	This is Version 2 of the alternative. Shown with ANAC 15 Alternative 2 Version 2 and radar tracks as requested by CAC at August 30, 2018 meeting.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (white), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); San Diego County Regional Airport Authority, May 2017 to December 2017 (radar data (light green)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., October 2018 (proposed procedure route (white), proposed procedure paths (orange) and proposed waypoints (white)).
Graphic Reference: Presented to TAC and CAC on October 25, 2018.

Screening Findings:

☐ Pass to Draft	☐ Pass to Final	☐ Pass to Next Steps
☐ Pass to Part 150	☐ Eliminate	☒ Pass to Next Steps After Part 150 Completion

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Keeps departures between 10:00 p.m. and 6:30 a.m. further south of La Jolla without affecting initial departure path predictability and area exposed to CNEL 65 or higher
- Ensures turns after initial heading do not occur prior to 1.5 NM from shoreline
- Aircraft start turn at 1.5 NM from shoreline just prior to waypoint and flies just south of waypoint to join next course
- Keeps nighttime departures further south of La Jolla
- Increases flight distance ~ 1.5 NM as compared to PADRZ departures at night
- Compatible with proposed ANAC Recommendation 15 Nighttime Alternative 2 refined design concept
- BROCK2 waypoint adjusted further west

Summary Narrative:

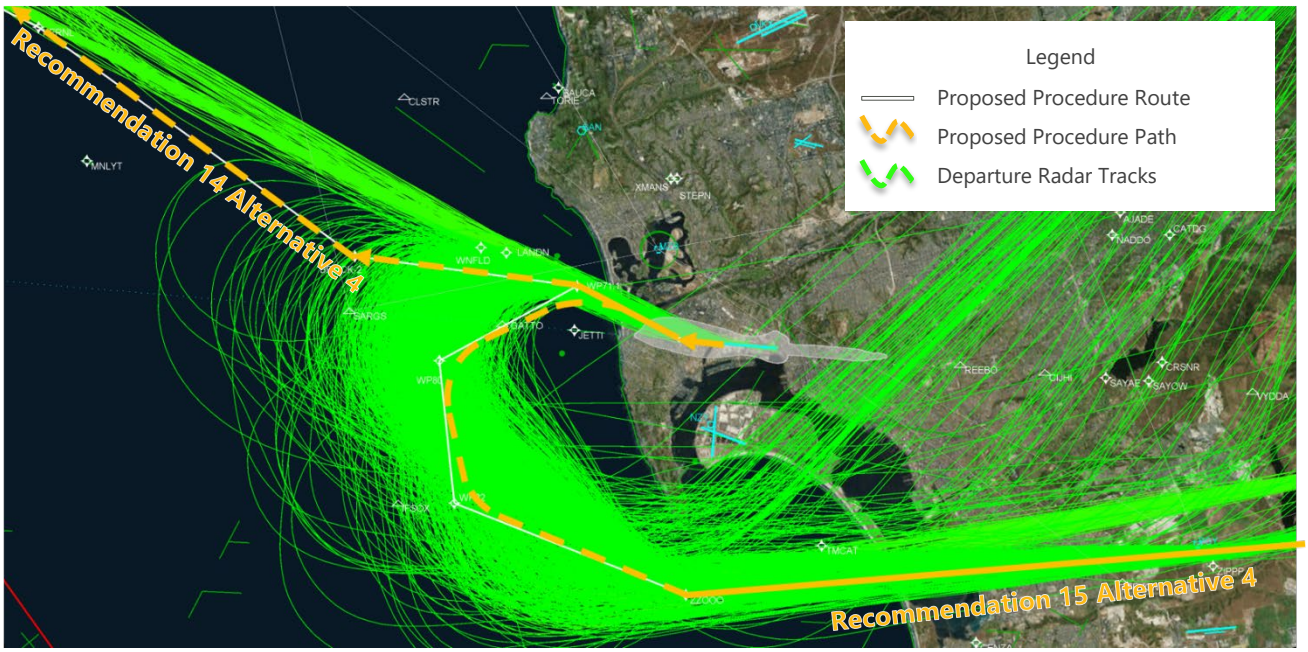
Recommendation 14 Alternative 1 Version 2, depicted with ANAC 15 Alternative 2, is a modification of the PADRZ TWO SID to include a left turn to the west to keep aircraft further south of the La Jolla area between the hours of 10:00 p.m. and 6:30 a.m. The design uses the same initial heading and RNAV coding that is used for the current PADRZ TWO SID to a new fly by waypoint, ANAC-14-1, located along the initial heading at two NM from the shoreline, then to BROCK2, then back to KERNL and the remaining waypoints on the PADRZ TWO SID. The design has been modified to ensure aircraft do not turn prior to the established noise dots located 1.5 NM from the shoreline. The design allows for predictable flight tracks that are designed to stay south of ANAC14-1. No changes were made to the design compared to the version evaluated under the Draft Design Concept phase. The design meets the intent of ANAC Noise Recommendation 14 and is compliant with the current early turn restrictions used by SCT TRACON for departures and missed approaches.

The noise screening results did not indicate a change in CNEL levels above 1 dBA, but indicated reduction at levels between 0.5 and 0.9 dBA for the La Jolla area. The recommendation was to proceed forward with Recommendation 14 Alternative 1 based on input provided by TAC and CAC at the May 23, 2019 meeting to maintain the 1.5 NM turn restriction. The increase in point of closest approach distance from the flight path and La Jolla met the intent of Recommendation 14.

TAC and CAC members were concerned about the nighttime noise abatement heading related to locating all departures between 10:00 p.m. and 6:30 a.m. along the current PADRZ RNAV SID initial departure traffic pattern. Based on TAC and CAC input, the final recommendation was to hold from proceeding forward until ANAC Recommendation 17 and 21 are addressed in the Title 14 CFR Part 150 process in order to incorporate the result as part of the procedure design concept.

D.3.2 RECOMMENDATION 14 ALTERNATIVE 4 - FLY BY TURN BETWEEN SHORELINE AND 1.5 NM (NIGHTTIME)

ANAC RECOMMENDATION:	14 ALTERNATIVE 4 – FLY BY TURN BETWEEN SHORELINE AND 1.5 NM (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Final Design Concept – Version 1
Description:	The concept involves a redesign of the PADRZ TWO SID using the same initial heading to a fly by waypoint located between 0.5 and 1.0 NM from the shoreline, then to a new waypoint located due west, then to KERNL and the remaining waypoints on the PADRZ TWO SID.
Intent:	Revise PADRZ SID or create a new procedure to reduce noise in the La Jolla and Pacific Beach areas.
Version Notes:	This is the initial version of the alternative. Shown with Recommendation 15 Alternative 4 and radar tracks as requested by CAC at August 30, 2018 meeting.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (white), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); San Diego County Regional Airport Authority, May 2017 to December 2017 (radar data (light green)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., October 2018 (proposed procedure route (white), proposed procedure paths (orange) and proposed waypoints (white)).
Graphic Reference: Presented to TAC and CAC on October 25, 2018.

Screening Findings:

☐ Pass to Draft	☐ Pass to Final	☐ Pass to Next Steps
☐ Pass to Part 150	☒ Eliminate	☐ Pass to Next Steps After Part 150 Completion

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☒ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Keeps departures between 10:00 p.m. and 6:30 a.m. further south of La Jolla without affecting initial departure path predictability and area exposed to CNEL 65 or higher
- Increases flight distance approximately 0.75 NM as compared to PADRZ SID departures at night
- Compatible with proposed ANAC Recommendation 15 Nighttime Alternative 4 design concept

Summary Narrative:

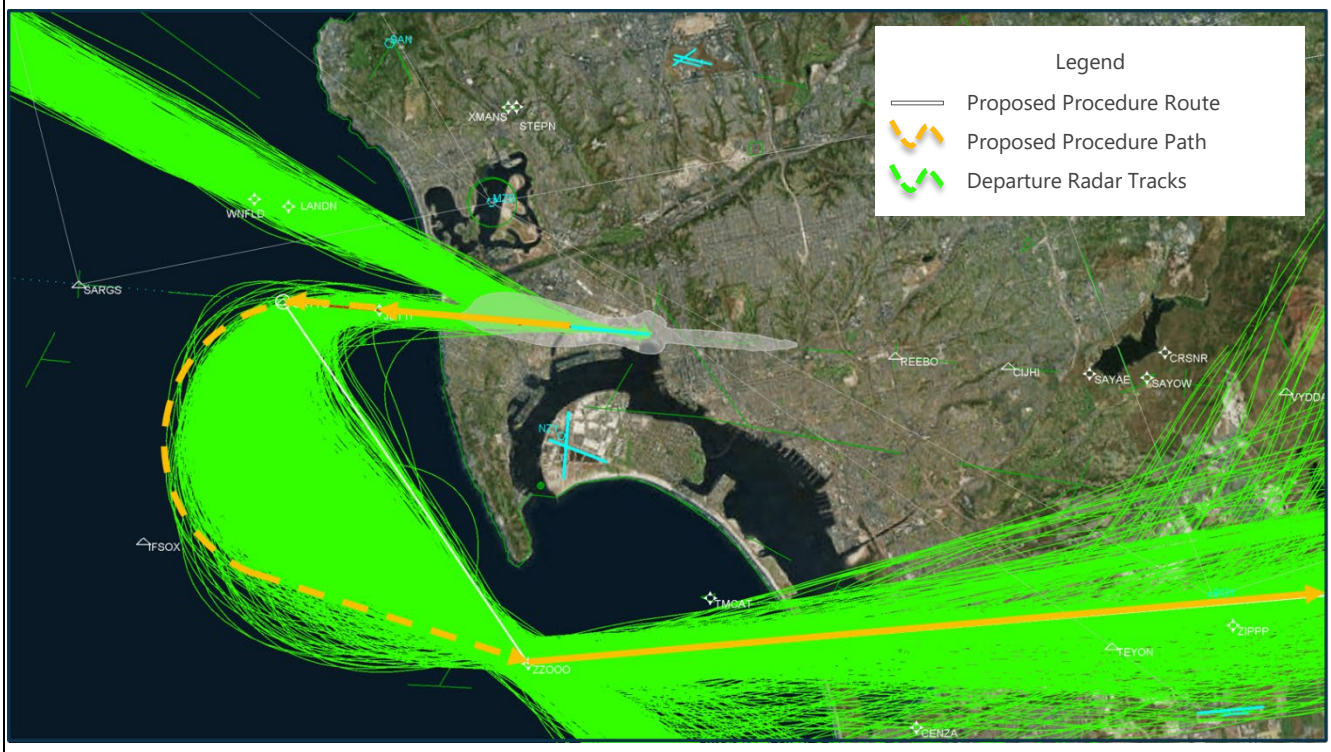
Recommendation 14 Alternative 4, depicted with ANAC 15 Alternative 4, is a modification of the PADRZ TWO SID to include a left turn to the west to keep aircraft further south of the La Jolla area between the hours of 10:00 p.m. and 6:30 a.m. It was introduced in the Draft Concept Design phase of the project due to the elimination of Recommendation 14 Alternatives 2 and 3 and based on CAC request to evaluate a design that can turn aircraft west as soon as possible. This design requires the 1.5 NM shoreline agreement would not apply (note: Noise Dots 4 and 5 would still be applicable).

Recommendation 14 Alternative 4 design includes an early turn beyond the shoreline but prior to 1.5 NM in attempt to identify the earliest location an aircraft may turn west within FAA RNAV design criteria, meeting the TARGETS flyability assessment, and without affecting the CNEL 65 noise exposure area. The design uses the same initial heading and RNAV coding that is used for the current PADRZ TWO SID to a new fly by waypoint, WP71, located along the initial heading at one NM from the shoreline, then to BROCK2, then back to KERNL and the remaining waypoints on the PADRZ TWO SID. A small adjustment to the new fly by waypoint was made to ensure the initial departure path from Runway 27 matched the existing PADRZ TWO SID path. The design meets the intent of ANAC Noise Recommendation 14. The design is not consistent with the current early turn restrictions used by SCT TRACON for departures and missed approaches. A change would be required in the SCT SOP if this alternative is pursued.

The noise screening results did not indicate a change in CNEL levels above 1 dBA, but indicated reduction at levels between 0.5 and 0.9 dBA for the La Jolla area. The recommendation was not to proceed forward with Recommendation 14 Alternative 4 based on input provided by TAC and CAC at the May 23, 2019 meeting to maintain the 1.5 NM turn restriction. Aircraft noise screening results indicated no substantial differences in CNEL level reductions between Recommendation 14 Alternative 1 and Alternative 4. Because both cannot be implemented, the recommendation was to proceed forward with Recommendation 14 Alternative 1.

D.3.3 RECOMMENDATION 15 ALTERNATIVE 1 - EXTEND JETTI WAYPOINT 2 NM WEST (DAYTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 1 – EXTEND JETTI 2 NM WEST (DAYTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Daytime (6:30 a.m. to 9:59 p.m.) Departure
Version:	Final Design Concept – Version 1
Description:	The concept involves a modification of the ZZOOO TWO SID where the JETTI waypoint is moved two NM further west of its current location.
Intent:	Revise the ZZOOO SID to move departures further west of the Point Loma shoreline, reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to cross over ZZOOO waypoint at a higher altitude compared to current conditions.
Version Notes:	This is the initial version of the alternative shown with radar tracks as requested by CAC at August 30, 2018 meeting.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (white), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); San Diego County Regional Airport Authority, May 2017 to December 2017 (radar data (light green)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., October 2018 (proposed procedure route (white), proposed procedure paths (orange) and proposed waypoints (white)).
Graphic Reference: Presented to TAC and CAC on October 25, 2018.

Screening Findings:

- ☐ Pass to Draft
- ☐ Pass to Final
- ☒ Pass to Next Steps
- ☐ Pass to Part 150
- ☐ Eliminate
- ☐ Pass to Next Steps After Part 150 Completion

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Meets required minimum distance between JETTI and ZZOOO waypoints – no waiver required
- Increase flight distance should increase frequency of aircraft over 8,000 feet MSL near ZZOOO waypoint (from 85% to over 95%)
- Moves dispersion of traffic further west from Point Loma
- Would increase flight distance by 2.95 NM compared to existing ZZOOO SID
- Maintains all existing routes after ZZOOO waypoint
- Radar vector may occur during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Summary Narrative:

Recommendation 15 Alternative 1 is designed to shift the JETTI waypoint further west with intent of keeping aircraft further west of the Point Loma shoreline and to provide more flight track distance for aircraft to climb to achieve 8,000 feet at the ZZOOO waypoint. This alternative was also designed to remove the current speed restriction on the ZZOOO TWO required to ensure aircraft flyability from JETTI to ZZOOO. No changes were made to the design compared to the version evaluated under the Draft Design Concept phase. The procedure design meets FAA criteria and passes the TARGETS flyability assessment, and the intent of the recommendation.

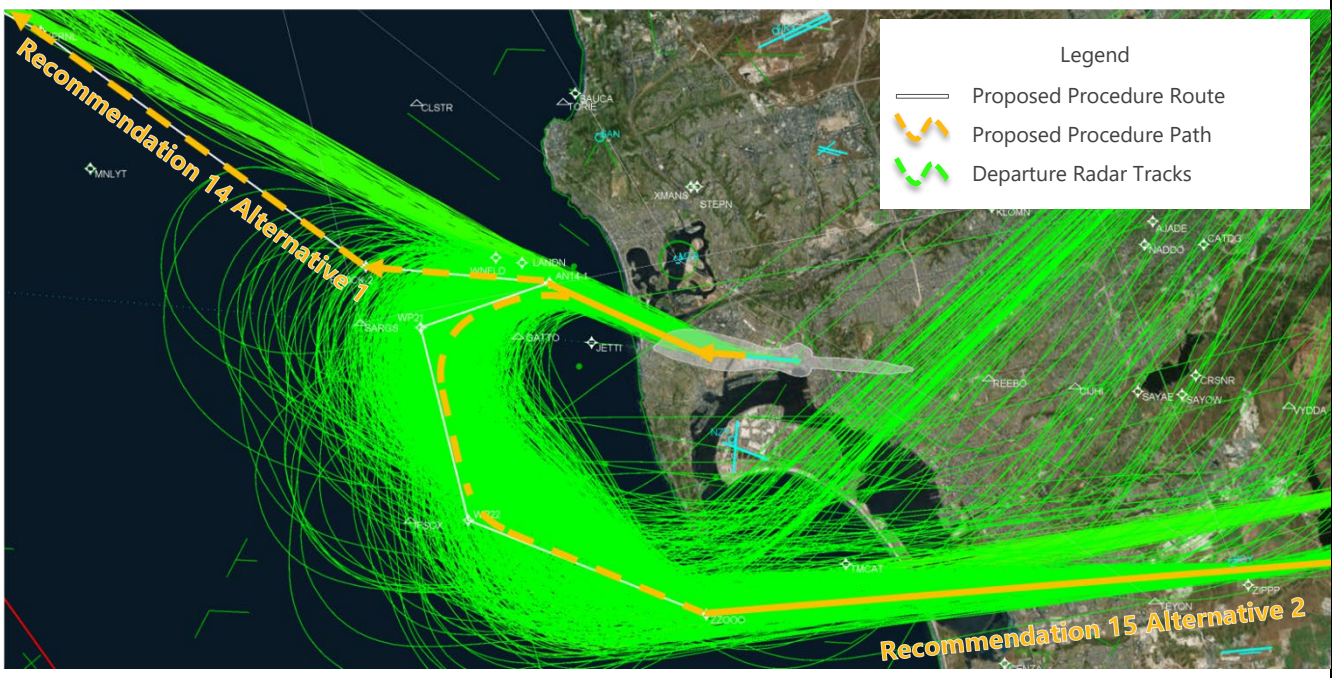
The aircraft noise screening analysis indicated CNEL levels within Point Loma near the shoreline may expect a decrease between 1 and 2 CNEL dBA. The decrease was attributed to increasing the distance between the shoreline and jet traffic turning south after passing the GATTO waypoint. Several grid points located in the southern portion of the Point Loma peninsula did indicate a reduction, but did not exceed 1 CNEL dBA.

CAC member input indicated concerns related to assumed FAA ATC radar vectoring. CAC's understanding of Recommendation 16 intent was to reduce radar vectoring. Radar heading vectors will always occur as needed to ensure safe and efficient movement of aircraft. A procedure design would not prevent FAA's ability to issue radar vector headings. The noise screening assumption was to maintain current radar vector patterns for Recommendation 15 Alternative 1. There was no indication from FAA that the proposed design would reduce or eliminate the need to radar vector aircraft as needed to ensure safe separation.

The recommendation was to proceed forward with Recommendation 15 Alternative 1. The aircraft noise screening results indicated a decrease between 1 and 2 CNEL dBA along the Point Loma peninsula shoreline by moving the eastbound jet departures further west as aircraft proceed south prior to turning left to the east. The primary concern with Recommendation 15 Alternative 1 concept design was the increase in flight distance. During the formal review process, FAA will determine if the proposed concept impacts FAA's ability to meet their mission and goals. The FAA, along with airline input, will weigh the benefits versus the potential impacts (e.g., increased time and workload in sector, fuel burn). A reduction between 1 and 2 CNEL may not be enough to overcome the costs associated with additional fuel burn or potential impact in managing traffic in an efficient manner comparable to existing conditions.

D.3.4 RECOMMENDATION 15 ALTERNATIVE 2 VERSION 2 - FLY BY TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 2 VERSION 2– FLY BY TURN AT 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Final Design Concept – Version 2
Description:	The concept involves the development of a new SID using the initial heading design of the PADRZ TWO SID to a fly by waypoint located two NM from the shoreline, then to a new fly by waypoint, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.
Intent:	Revise the ZZOOO SID to significantly reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to reduce east bound turns over La Jolla.
Version Notes:	This is the version 2 of the concept. Shown with Recommendation 14 Alternative 1 Version 2 and radar tracks as requested by CAC at August 30, 2018 meeting.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (white), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); San Diego County Regional Airport Authority, May 2017 to December 2017 (radar data (light green)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., October 2018 (proposed procedure route (white), proposed procedure paths (orange) and proposed waypoints (white)).
Graphic Reference: Presented to TAC and CAC on October 25, 2018.

Screening Findings:

☐ Pass to Draft	☐ Pass to Final	☐ Pass to Next Steps
☐ Pass to Part 150	☐ Eliminate	☒ Pass to Next Steps After Part 150 Completion

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Ensures turns after initial heading do not occur prior to 1.5 NM from shoreline
- Aircraft start turn at 1.5 NM from shoreline just prior to waypoint and flies just south of waypoint to join next course
- Keeps nighttime departures further west of Point Loma and increases frequency of aircraft at or above 8,000 feet MSL near ZZOOO waypoint
- Compatible with proposed ANAC Recommendation 14 Alternative 1 fly by nighttime design concept
- Maintains routes after ZZOOO waypoint
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Summary Narrative:

This design, depicted with Recommendation 14 Alternative 2, is predicated on the establishment of a new RNAV procedure for nighttime departures to the south and east. Currently, this is a vector only operation. The design of the procedure uses initial heading of the PADRZ TWO SID to a fly by waypoint, ANAC14-1, located two NM from the shoreline. This is the same waypoint as used in Recommendation 14 Alternative 1 Version 2 fly by design. Aircraft will then track to a new fly by waypoint located west of JETTI, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID. The design meets the intent of Recommendation 15, is compatible with Recommendation 14 Alternative 1 Version 2, meets FAA design criteria, and is compliant with the current early turn restrictions used by SCT TRACON for departures and missed approaches.

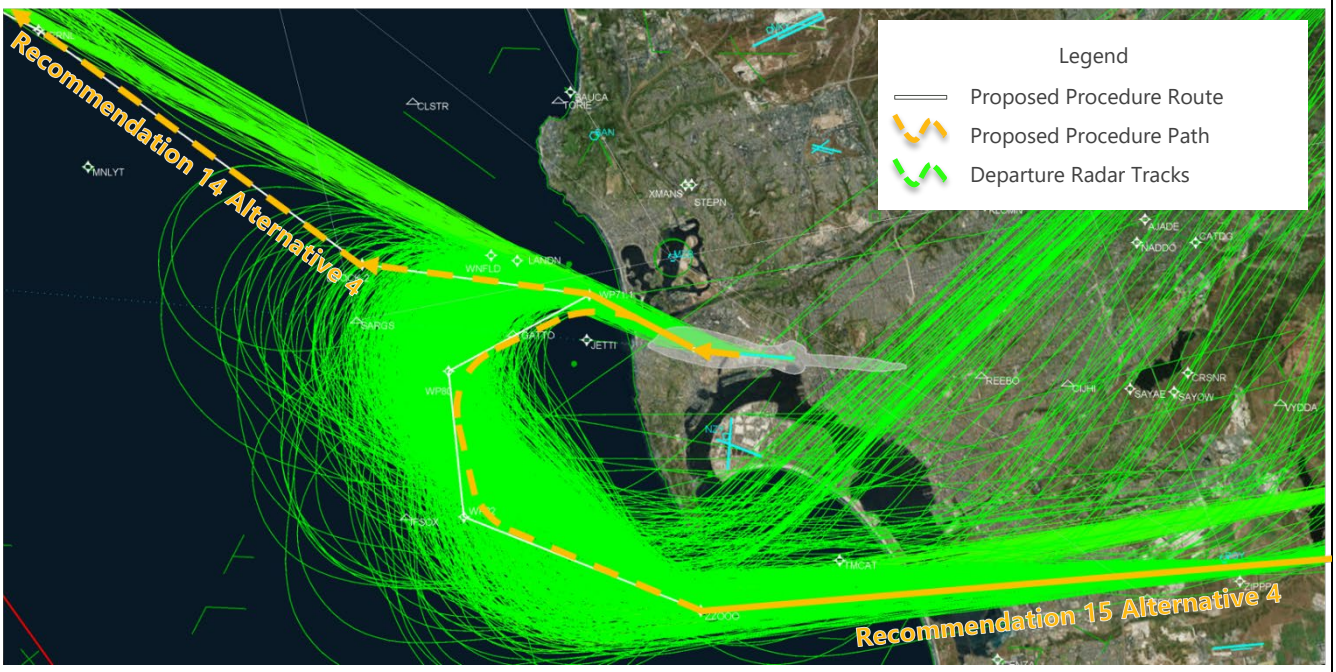
The aircraft noise screening results indicated a decrease in CNEL levels between 1 and 2 dBA for the northern area of La Jolla as a result of redirecting eastbound departures that turn right then over La Jolla to the proposed procedure design directing aircraft south then to the ZZOOO waypoint. The change in CNEL levels within the Point Loma area did not exceed 1 CNEL dBA, but there were decreases in CNEL below 1 dBA with the southern area of Point Loma. Eighty-one percent of all jet departures on the nighttime noise abatement heading that turn left to the south then east were modeled on the proposed final design RNAV SID. The remaining 19 percent followed the same FAA ATC radar vector patterns observed in the baseline model. The results are similar for Recommendation 15 Alternative 4.

The recommendation was to proceed forward with Recommendation 15 Alternative 2 based on input provided by TAC and CAC at the May 23, 2019 meeting to maintain the 1.5 NM turn restriction. Aircraft noise screening results indicated no substantial differences in CNEL level reductions between Alternative 2 and 4. Because both Alternative 2 and 4 cannot be implemented, the recommendation was to proceed forward with Recommendation 15 Alternative 2 to maintain the 1.5 NM turning restriction.

TAC and CAC members were concerned about the nighttime noise abatement heading related to locating all departures between 10:00 p.m. and 6:30 a.m. along the current PADRZ RNAV SID initial departure traffic pattern. Based on TAC and CAC input, the final recommendation was to hold from proceeding forward until ANAC Recommendation 17 and 21 are addressed in the Title 14 CFR Part 150 process in order to incorporate the result as part of the procedure design concept.

D.3.5 RECOMMENDATION 15 ALTERNATIVE 4 - FLY BY TURN BETWEEN SHORELINE AND 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)

ANAC RECOMMENDATION:	15 ALTERNATIVE 4 – FLY BY TURN BETWEEN SHORELINE AND 1.5 NM FROM SHORELINE THEN TO ZZOOO WAYPOINT (NIGHTTIME)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (10:00 p.m. to 6:30 a.m.) Departures
Version:	Final Design Concept – Version 2
Description:	The concept involves the development of a new SID using the same initial heading design of the PADRZ TWO SID to a fly over waypoint located between 0.5 to 1.0 NM from the shoreline, then to a new fly by waypoint, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID.
Intent:	Revise the ZZOOO SID to significantly reduce or eliminate flight paths over the Point Loma Peninsula, including Cabrillo National Park and to reduce east bound turns over La Jolla.
Version Notes:	This is the initial version of the concept. Shown with Recommendation 14 Alternative 4 and radar tracks as requested by CAC at August 30, 2018 meeting.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (white), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); San Diego County Regional Airport Authority, May 2017 to December 2017 (radar data (light green)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., October 2018 (proposed procedure route (white), proposed procedure paths (orange) and proposed waypoints (white)).
Graphic Reference: Presented to TAC and CAC on October 25, 2018.

Screening Findings:

☐ Pass to Draft	☐ Pass to Final	☐ Pass to Next Steps
☐ Pass to Part 150	☒ Eliminate	☐ Pass to Next Steps After Part 150 Completion

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☒ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Aircraft would turn left approximately 0.5 NM west of the shoreline
- Compatible with Recommendation 14 Alternative 4 with same fly by waypoint location
- Keeps nighttime departures further west of Point Loma
- Expected to increase frequency of aircraft at or above 8,000 feet MSL near ZZOOO waypoint, but not as much as Recommendation 15 Alternative 2 due to shorter flight distance
- Maintains all existing routes after ZZOOO waypoint
- Not feasible during Contra-Flow operations (arrivals on Runway 9 and departures on Runway 27)

Summary Narrative:

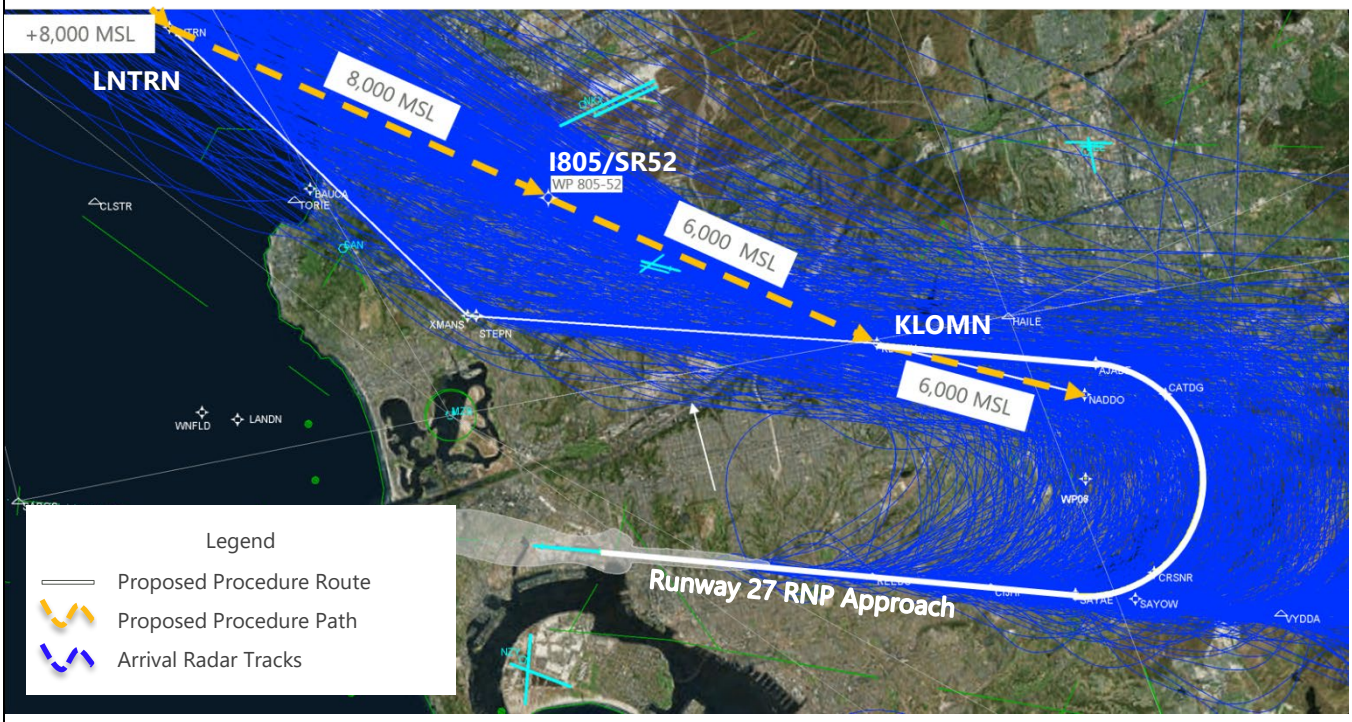
This design, depicted with Recommendation 14 Alternative 4, is predicated on the establishment of a new RNAV procedure for nighttime departures to the south and east. Currently, this is a vector only operation. Recommendation 15 Alternative 4 design includes an early turn beyond the shoreline but prior to 1.5 NM in attempt to identify the earliest location an aircraft may turn west within FAA RNAV design criteria, meeting the TARGETS flyability assessment, and without affecting the CNEL 65 noise exposure area. This was designed to provide an eastbound departure procedure that is compatible with Recommendation 14 Alternative 4. The design uses the same initial heading and RNAV coding that is used for the current PADRZ TWO SID to a new fly by waypoint, WP71, located along the initial heading at one NM from the shoreline. The fly by waypoint is the same waypoint used in Recommendation 14 Alternative 4 to ensure compatibility between the two designs. Aircraft will then track to a new fly by waypoint located west of JETTI, then to the ZZOOO waypoint and the remaining portion of the ZZOOO TWO SID. The design meets the intent of ANAC Noise Recommendation 15. The design is not consistent with the current early turn restrictions used by SCT TRACON for departures. A change would be required in the SCT TRACON SOP to eliminate the 1.5 NM turn restriction if this alternative is pursued.

The aircraft noise screening results indicated a decrease in CNEL levels between 1 and 2 dBA for the northern area of La Jolla as a result of redirecting eastbound departures that turn right then over La Jolla to the proposed procedure design directing aircraft south then to the ZZOOO waypoint. The change in CNEL levels within the Point Loma area did not exceed 1 CNEL dBA, but there were decreases in CNEL below 1 dBA with the southern area of Point Loma. Eighty-one percent of all jet departures on the nighttime noise abatement heading that turn left to the south then east were modeled on the proposed final design RNAV SID. The remaining 19 percent followed the same FAA ATC radar vector patterns observed in the baseline model. The results were similar to Recommendation 15 Alternative 2.

The recommendation was not to proceed forward with Recommendation 15 Alternative 4 based on input provided by TAC and CAC at the May 23, 2019 meeting to maintain the 1.5 NM turn restriction. Aircraft noise screening results indicated no substantial differences in CNEL level reductions between Recommendation 15 Alternative 2 and Alternative 4.. Because both cannot be implemented, the recommendation was to proceed forward with Recommendation 15 Alternative 2.

D.3.6 RECOMMENDATION 16 ALTERNATIVE 1 VERSION 3 - CROSS LNTRN WAYPOINT AT OR ABOVE 8,000 FT. TO I805/SR52 AT 7,000 FT. TO KLOMN WAYPOINT AT 6,000 FT.

ANAC RECOMMENDATION:	16 ALTERNATIVE 1 VERSION 3– CROSS LNTRN WAYPOINT AT OR ABOVE 8,000 FT. TO I805/SR52 AT 7,000 FT. TO KLOMN WAYPOINT AT 6,000 FT.
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Arrivals
Version:	Final Design Concept – Version 3
Description:	The concept involves the revision of the COMIX STAR with direct routing from LNTRN to a new fly by waypoint at I805/SR52 to KLOMN. Aircraft will cross LNTRN at or above 8,000 feet, I80/SR72 at 8,000 feet, and KLOMN at 6,000 feet.
Intent:	Reassess and revive the entire arrival corridor in a manner that more appropriately "shares the noise" instead of concentrating arrivals from the North into a very narrow corridor.
Version Notes:	This is version 3 of the concept. Shown with radar tracks as requested by CAC at August 30, 2018 meeting.



Graphic Source: Federal Aviation Administration, February 2018 (radar video map (green), waypoints (white), runways (cyan), Runway 27 RNP approach (white) and navigational aids (cyan)); San Diego County Regional Airport Authority, May 2017 to December 2017 (radar data (blue)); HMMH, March 2018 (4th Quarter 2017 Title 21 CNEL 65 dB contour (white filled area)); Ricondo & Associates, Inc., August 2018 (proposed procedure route (white), proposed procedure path (orange) and proposed waypoints (white)).
Graphic Reference: Presented to TAC and CAC on October 25, 2018.

Screening Findings:

☐ Pass to Draft	☐ Pass to Final	☐ Pass to Next Steps
☐ Pass to Part 150	☒ Eliminate	☐ Pass to Next Steps After Part 150 Completion

Reason for Elimination:

☐ 65 CNEL Influence	☐ ANAC Intent	☐ Charting Requirements	☐ Design Criteria	☐ Duplicate ANAC #
☐ Existing Compliance	☐ Not Applicable	☒ Noise Impact	☐ Operational Feasibility	☐ Safety

Design Notes:

- Design includes proposed waypoint at I-805 and SR-52
- Due to elimination of longer downwind pattern, may cause FAA ATC vectoring off procedure to manage traffic into final approach and/or airlines inability to descent and reduce speed as requested by FAA ATC
- Possible ATC issues with MCAS Miramar
- Moves noise from one community to another - may be deemed infeasible by FAA due to environmental concerns
- Maintains all existing routes up to LNTRN waypoint.
- COMIX crossing altitude window modified to be 12,000 to 14,000
- Reduces the flight track one NM

Summary Narrative:

Recommendation 16 Alternative 1 Version 3 was introduced in the Draft Design Concept phase in attempt to design a procedure that may be acceptable to the airlines operating at San Diego International Airport and meet ANAC's intended flight path location for Recommendation 16.

The new design includes a crossing of LNTRN at or above 8,000 MSL and requires a redesign of some of the altitudes on COMIX TWO STAR from the COMIX waypoint to LNTRN. The current COMIX waypoint altitude is a window altitude between 12,000 and 15,000 feet MSL. To pass design criteria, the window altitude over the COMIX waypoint was reduced between 12,000 and 14,000 feet MSL. Based on a cursory review, FAA did not indicate a major concern with the change, but indicated possible concerns related to maintaining an optimized descent as intended in the current procedure. The procedure complies with FAA criteria and the TARGETS flyability assessment tool.

As in the case of previous versions for Recommendation 16 Alternative 1, the new route changes the flight track for the arrival resulting in a shift in noise from one community to another. The new route also reduces the sequencing and spacing area available to SCT TRACON for arrivals and places traffic within the Miramar Marine Corps Air Station Airspace where possible conflicts may occur.

The aircraft noise results indicated CNEL levels increases as high as 5 CNEL dBA and decreases just under 5 CNEL dBA throughout northern San Diego. The changes in CNEL were attributed to moving 65 percent of all jet arrivals from the northwest from the current COMIX RNAV STAR flight path to the proposed Recommendation 16 Alternative 1 final design flight path. The change in flight path accomplished the intent to reduce CNEL levels within La Jolla. The change also provided a reduction over areas such as Clairemont and Clairemont Mesa. Although, the change in flight path would increase CNEL levels to noticeable levels over areas such as the University of California San Diego, University City and Kearny Mesa. If implemented, it is reasonable to expect residents located underneath the proposed path will notice an increase in overflights. Based on the noise screening results, achieving a reduction in noise for the La Jolla area by the relocation of the jet arrival flight path will cause a noticeable increase in noise for other communities.

The recommendation was not to proceed forward with Recommendation 16 Alternative 1 Version 3 due to the potential for substantial increase in aircraft noise levels for areas such as the University of California San Diego, University City and Kearny Mesa. Increasing noise exposure levels over one community to decrease noise for another community is not an effective noise abatement approach. The design also did not fully address concerns with the operational feasibility based on user input. Concerns related to meeting required descent altitudes and speed reductions continued to exist by members of TAC who represent users.

APPENDIX E

East San Diego County Flight Procedure Evaluation

March 2020 |

San Diego International Airport

Air Traffic Flight Procedure Evaluation
East San Diego County Flight Procedure Evaluation

Prepared for:

San Diego County Regional Airport Authority

Prepared by:

RICONDO

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF EXHIBITS

1. EXECUTIVE SUMMARY

The San Diego International Airport (SDIA or the Airport) Air Traffic Flight Procedure Evaluation (Flight Procedure Evaluation) was conducted in fulfillment of the San Diego County Regional Airport Authority's (the Authority's) action plan to evaluate the feasibility of the SDIA Airport Noise and Advisory Committee's (ANAC's) noise reduction recommendations related to published instrument flight procedures (flight procedures).[1] Through discussions at multiple meetings, it was recognized that the ANAC recommendations did not include any recommendations specific to the areas located east of the Airport. As a result, on August 30, 2018, the Authority staff determined the most effective way to evaluate the complex air traffic environment and the related flight procedures over communities located in East San Diego County (East County) was to collaborate with a working group comprised of community representatives located in East County.

The intent of working with the East County Working Group (ECWG) was to understand SDIA aircraft overflight noise concerns and to collect input from community representatives on flight procedure concepts designed to address concerns. According to discussions with the ECWG, the primary noise concerns were related to jet arrivals from the northwest to SDIA when aircraft are landing on Runway 27. The concerns were as follows:

- A change in the arrival traffic pattern was noticeable in late 2016.
- Residents are hearing more noise in the morning (6:30 a.m. to 11:00 a.m.) and in the late evening (10:00 p.m. to 11:00 p.m.).
- Aircraft are lower as they proceed south to join the final approach to Runway 27.
- Aircraft overflights over the East County communities have increased.

A detailed operations analysis was conducted, which concluded the following:

- Arrival traffic was concentrated over some East County communities after the Federal Aviation Administration's (FAA's) implementation of the BAYVU 5 area navigation (RNAV)[2] standard terminal approach route (STAR)[3] procedure and the Runway 27 required navigation performance (RNP) approach in November 2016.
- The average altitude of aircraft turning south to join the final approach did not change, but the concentration of arrivals along an RNAV route between two waypoints, KLOMN and NADDO, increased the frequency of aircraft at altitudes below 6,000 feet mean sea level (MSL).

[1] Flight procedure is a predefined set of guidance instructions that define a route for a pilot to follow.

[2] RNAV permits aircraft operation on any flight path within the coverage of referenced navigation aids, such as Global Positioning System (GPS) network, distance measuring equipment (DME), and/or very high omnidirectional radial (VOR). The method relies on navigational aids to provide the position of an aircraft both laterally and vertically.

[3] The STAR is a published instrument arrival procedure that provides pilots with defined lateral and vertical guidance to facilitate safe and predictable navigation from a specific high-altitude route in the enroute airspace through the terminal airspace to an airport. A "conventional" STAR follows a route between two points defined by ground-based navigational aids, and/or it may be based on air traffic controller–issued headings or vectoring. An RNAV STAR defines a more predictable path through the airspace than a conventional STAR through the combination of GPS and aircraft flight management systems (aircraft autopilot or flight path guidance on screen).

- The number of arrivals increased over the years as a result of higher air traffic demand, but the proportion of arrivals from the northwest compared to other directions (i.e., arrivals from the east and south) have remained the same.
- The management of arrival traffic over East County is complex and requires flexibility for FAA air traffic controllers to manage arrivals from all directions and merge the traffic on the final approach in a safe and efficient manner.

The initial discussions with the ECWG focused on the establishment of the current traffic environment and the available methods to reduce noise for East County. As a result, the following objectives were established for alternatives to reduce noise:

- Maintain flight path dispersion.
- Raise altitudes over populated areas.
- Turn south to join final approach over less populated areas.

The purpose of the East County Flight Procedure Evaluation was to determine the feasibility of conceptual standard instrument flight procedures intended to address noise concerns and objectives identified by the ECWG. This report provides documentation related to an independent conceptual design and screening evaluation of the proposed flight procedure recommendations, which was conducted by the consultant, Ricondo & Associates, Inc. (Ricondo).

The analysis process involved three phases of conceptual design: Preliminary Draft Design Concept, Draft Design Concept, and Final Design Concept. In the Preliminary Draft Design Concept phase, initial design concepts were developed to satisfy the intent of addressing ECWG noise concerns. Designs that did not meet the evaluation's objectives—reduce noise, maintain safety, maintain airfield capacity, ensure the required performance-based navigation (PBN)[4] RNAV procedure design criteria are met, complement existing air traffic regulations, and/or avoid substantial operational hurdles—were not considered.

The Draft Design Concept phase included refinement and more detailed concept procedure design of the remaining recommendations, or it included a derivative of a recommendation that was eliminated in the Preliminary Draft Design Concept phase. Concepts that did not meet operational and PBN RNAV procedure design criteria and/or did not reflect the FAA's mission and goals related to safe and efficient management of air traffic were eliminated. Recommendations and the related conceptual procedure designs that passed through the Draft Design Concept phase screening analysis were carried forward to the Final Design Concept phase.

With the safety, operational, and PBN RNAV procedure design criteria merits of each measure assessed in the first two phases, the Final Design Concept phase screening analysis was based on aircraft noise exposure. The results of the analysis were used to determine potential changes in Community Noise Equivalent Level (CNEL)[5] decibel (dB) noise exposure levels. Potential increases in the CNEL were carefully considered to determine if the change would be consistent with FAA policy regarding noise exposure and noise abatement, and if the FAA would require

[4] PBN is an advanced, satellite-enabled form of air navigation in the National Airspace System that creates precise 3-D flight paths. Procedures are based on the RNAV method of navigation and the precision requirements to ensure aircraft are within a set distance from the intended route (known as "lateral containment"). Performance requirements are based on the type of navigation (e.g., satellite or ground-based navigational aid), equipment on the aircraft, and pilot training.

[5] CNEL is the average sound level over a 24-hour period, with a penalty of 5 decibels (dB) added between 7:00 p.m. and 9:59 p.m. and a penalty of 10 dB added for the nighttime hours of 10:00 p.m. to 6:59 a.m.

additional environmental analysis and documentation.

The process involved coordination with the ECWG and the FAA Air Traffic Organization (ATO) representatives to:

- Confirm the intent of each measure.
- Understand the current air traffic control (ATC) environment to determine concept procedure opportunities.
- Collect feedback on operational aspects of the procedure design concepts.
- Review and collect input on initial findings with community representatives.
- Modify design concepts to enhance feasibility.
- Evaluate potential changes to the CNEL if feasible design concepts were implemented.
- Collect input on the results with community representatives.
- Recommend feasible procedure design concepts to the Authority for further consideration.

Ricondo designed and evaluated seven (7) unique flight procedure concepts throughout the process. The number of design concepts evaluated for each phase were as follows:

- Preliminary Draft Design Concept – Five design concepts were developed and evaluated. One was a newly designed procedure; one was to maintain an existing procedure but emphasize use; and three involved proposed modifications to existing procedures. One was passed to the next phase, and four were eliminated from further consideration based on the ECWG objectives or operational feasibility issues.
- Draft Design Concept – Three design concepts were developed and evaluated. Two were newly designed approach procedures, and one proposed a modification to an existing procedure that was evaluated under the Preliminary Draft Design Concept phase. The intent of the design concepts was to raise altitude and increase dispersion and turn aircraft over less populated areas during low demand periods. Two design concepts were passed to the next phase, and one was eliminated from further consideration due to design criteria.
- Final Design Concept – Two design concepts from the Draft Design Concept phase were evaluated for potential changes in CNEL noise exposure. Based on the ECWG's objectives, FAA design criteria, noise modeling results, and input from ECWG representatives, Ricondo did not recommend proceeding forward with the two design concepts due to increases in the CNEL.

The following sections describe the project background, the analysis process, the findings related to each proposed concept related to air traffic procedures, and the recommended conceptual designs for Authority consideration.

2. BACKGROUND

Over the past several years, aircraft noise concerns have increased in communities surrounding San Diego International Airport (SDIA or the Airport), including the eastern area of San Diego County (East County). Many believe the concerns were a result of the Federal Aviation Administration (FAA) Air Traffic Organization's (ATO's) Southern California Metroplex (SoCal Metroplex) area navigation (RNAV) procedure implementation project. These concerns were presented and studied further as part of SDIA Airport Noise and Advisory Committee (ANAC) proceedings. The San Diego County Regional Airport Authority (the Authority) relies upon the ANAC as a primary mechanism to coordinate aircraft noise issues. In accordance with Authority Board Policy 9.20, ANAC serves as a committee to the Authority Board and provides a forum for resident and community input and involvement on aircraft noise issues.

On October 18, 2017, ANAC requested the Authority staff to present 21 recommendations for noise reduction to the Authority Board. These recommendations were originally developed by the ANAC Subcommittee (Subcommittee) to address recent increased noise concerns in communities surrounding SDIA, including those related to the SoCal Metroplex RNAV published instrument flight procedures (flight procedures), which were implemented in early 2017. In September 2016, the Subcommittee developed a work plan to guide its efforts over a 1-year term. Authority staff facilitated the Subcommittee's deliberations through 12 public technical meetings. The final deliverable of the Subcommittee's efforts was the 21 recommendations presented to ANAC in October 2017.[6]

Authority staff reviewed the ANAC recommendations between October 2017 and December 2017 and developed an action plan to address the feasibility of each recommendation. Several recommendations were related to reducing noise levels below Community Noise Exposure Level (CNEL) 65 decibels (dB); however, the FAA does not typically consider this as an acceptable measure under Title 14 Code of Federal Regulations Part 150 (14 CFR Part 150), unless a proposed procedure change is expected to reduce the number of people exposed to CNEL 65 dB or higher.[7] The Authority decided to initiate and conduct the Flight Procedure Evaluation to evaluate the ANAC recommendations focused on reducing noise levels below CNEL 65 dB. This effort was conducted in parallel with the 14 CFR Part 150 study update process.

One of the most significant concerns raised at the October 18, 2017, ANAC meeting was the continuation of the Subcommittee (ANAC Recommendation 3). Authority staff recommended the continuation of the Subcommittee be accomplished through the establishment of a Citizen Advisory Committee (CAC) that would work alongside the Technical Advisory Committee (TAC) during the 14 CFR Part 150 study update process. Therefore, the CAC was established and held its first meeting on March 22, 2018. Concerns related to East County were revealed in discussions with CAC, which had one representative from East County. However, because the concerns specific to East County were not explicitly addressed in the ANAC recommendations, the Authority determined a working

[6] San Diego County Regional Airport Authority, *Board Agenda and Meeting Materials – December 7, 2017*, "Item 15 - Action Plan for Addressing the Airport Noise Advisory Committee (ANAC) Recommendations," Exhibit A: Airport Noise Advisory Committee (ANAC) Sub-committee Recommendation (ANAC Approval), Approved, https://san.org/Airport-Authority/Meetings-Agendas?EntryId=9048 (accessed September 13, 2018).

[7] CNEL 65 dB is considered the FAA's compatibility threshold for residential land use. Residential areas exposed to CNEL 65 dB or higher are considered incompatible, unless the residential unit was mitigated (e.g., sound insulation). Residential areas exposed to levels below CNEL 65 dB are considered compatible.

group comprised of multiple community areas in East County was necessary to ensure specific concerns throughout East County were adequately represented. The Authority worked with the East County ANAC representative in the formation of the East County Working Group (ECWG), which was announced to CAC on August 30, 2018.

The intent of the East County Flight Procedure Evaluation effort was to identify noise concerns; establish noise reduction objectives for ECWG; and identify conceptual flight procedure designs that met FAA design criteria, did not affect the safe and efficient movement of aircraft, and provided noise relief, as intended by the ECWG. The effort conducted was similar to the Flight Procedure Evaluation conducted for other communities, such as La Jolla, Mission Beach, Ocean Beach, and Point Loma, and it was designed to evaluate flight procedures similar to the FAA's first phase of its performance-based navigation (PBN) implementation process, as described in FAA Order 7100.41A, *Performance Based Navigation Implementation Process* (FAA Order 7100.41A).

The first phase of the FAA's process, called the Preliminary Activities phase, examines current operations, develops a concept, evaluates potential environmental issues, and determines expected benefits. Based on the information collected in the first phase, the FAA would determine if the request should proceed through the development and implementation process based on the FAA's mission and goals. The Authority tasked Ricondo & Associates, Inc. (Ricondo), an aviation advisory consulting services firm with expertise in aircraft noise planning and PBN RNAV procedure design, to assist in conducting the same type of efforts using the same toolsets the FAA uses as part of its process. Additionally, the Authority relied upon input from the ECWG members to aid in identifying potential concerns and to ensure the proposed design concepts met the overall objectives related to reducing aircraft noise.

3. EAST COUNTY NOISE CONCERNS

Because the ANAC recommendations did not document aircraft noise concerns specific to East County, the first step in the evaluation process was to learn about the aircraft noise concerns currently experienced by each representative from the ECWG. The first meeting held on December 6, 2018, focused on the current SDIA overflight patterns over East County and the noise concerns verbalized by each member of the ECWG. The intent was to identify the traffic patterns most likely associated with noise concerns that should be the focus of the East County Air Traffic Flight Procedure Evaluation (Flight Procedure Evaluation) effort.

The ECWG was comprised of representatives from several community areas in East County:

- Grossmont
- Mount Helix
- Lemon Grove
- Spring Valley
- La Mesa
- Valle De Oro
- Sweetwater
- El Cajon

Ricondo conducted an operations analysis between 2014 and 2018 related to jet arrivals into SDIA that operated over East County communities. The analysis utilized the Authority's Airport Noise and Operations Management System (ANOMS) data and analytic toolsets available in the system. The analysis focused on quantifying key operation patterns and possible changes since 2014, including the number of operations, flight path location, and average altitudes over the area. Ricondo presented the following findings to the ECWG on December 6, 2018 (refer to **Appendix A** to review presentations provided at ECWG meetings):

- July has been the month with the highest number of operations each year since 2014.
- The annual compound growth rate for July was 2.9 percent between 2014 and 2018.
- The proportion of jet arrivals from the northwest compared to other directions (i.e., east and south) was approximately 40 percent for each year between 2014 and 2018.
- Typical flight path locations changed in November 2016 after the FAA implemented the BAYVU 5 RNAV standard terminal arrival routes (STAR)[8] and Runway 27 required navigation performance (RNP) approach.

[8] The BAYVU 5 RNAV STAR was replaced by the COMIX 1 RNAV STAR between January and April 2017, but the route between the KLOMN and NADDO waypoints remained the same.

The most notable finding was the change in typical flight paths in November 2016. **Exhibit 3-1** depicts the radar track density of all arrivals into SDIA for July 2016, November 2016, and July 2017. The FAA implemented a change to the BAYVU RNAV STAR on November 2016 (called the BAYVU 5 RNAV STAR), which directed aircraft on the procedure to proceed southeast to a new waypoint called NADDO. Prior to November 2016, the BAYVU 4 RNAV STAR ended at the KLOMN waypoint, and aircraft would continue on an easterly heading until directed by FAA air traffic control (ATC) to turn south to merge the aircraft onto the final approach to Runway 27. According to FAA records, the additional route was added to provide predictable guidance for pilots to ensure aircraft remain within the Class B airspace.[9,10] As a result, overflight frequency increased for communities under the route.

At the first ECWG meeting held on December 6, 2018, each member was asked to describe observations and concerns they and their community had pertaining to SDIA-related aircraft noise. Based on the input provided, the following summarizes the concerns shared by each member:

- A change in the arrival traffic pattern was noticeable in late 2016.
- Residents are hearing more noise in the morning (6:30 a.m. to 11:00 a.m.) and in the late evening (10:00 p.m. to 11:00 p.m.).
- Aircraft overflights over East County communities have increased.
- Aircraft are lower as they proceed south to join the final approach to Runway 27.

The following paragraphs summarize the operations analysis conducted to identify potential contributors to the ECWG's observations and concerns.

Change in Air Traffic Pattern – The operational assessment suggests the change that East County communities have identified seems to be correlated to the change made in November 2016 by the FAA to the BAYVU RNAV STAR. The change provided a predictable and repeatable route that caused an increase in overflight concentration over communities located between the KLOMN and NADDO waypoints.

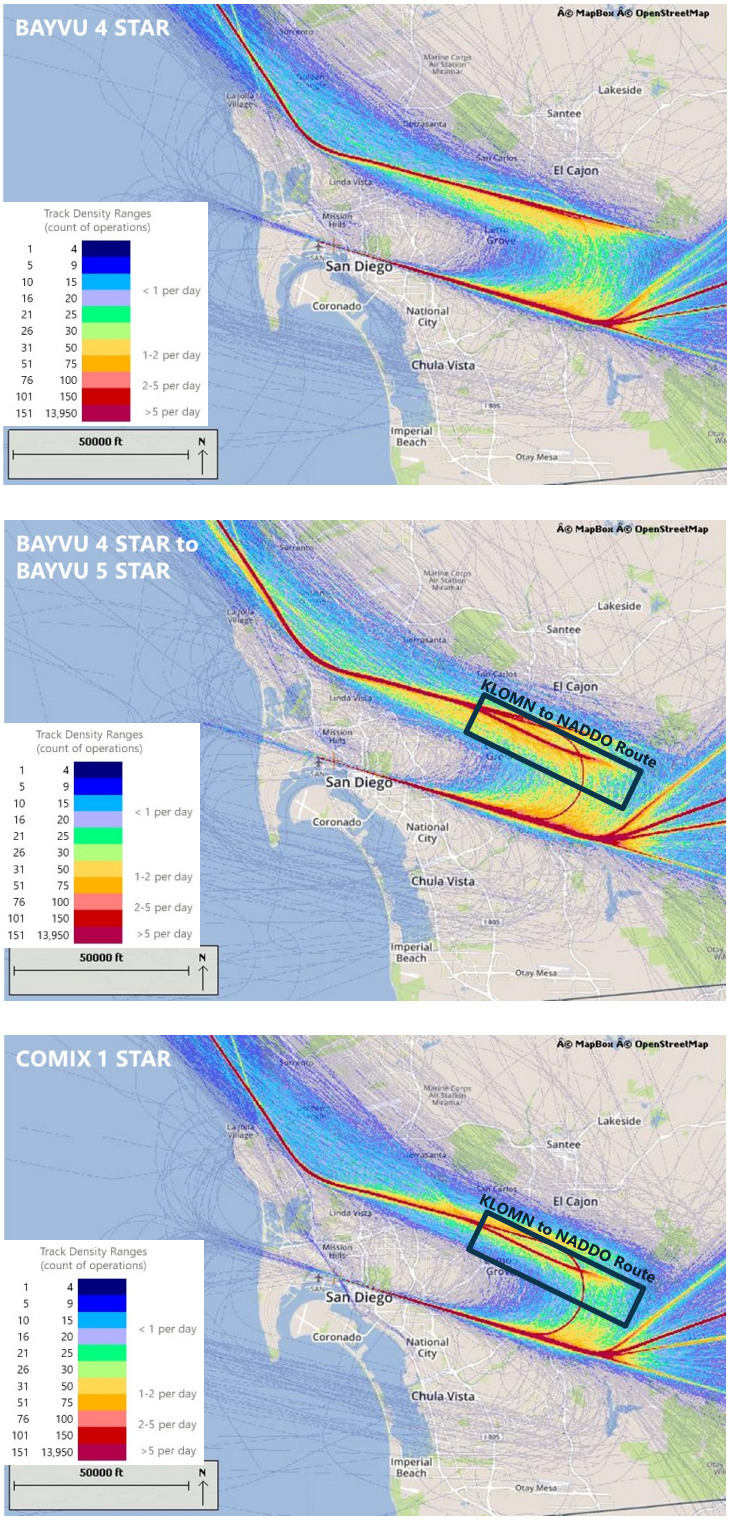
Aircraft Overflight Frequency and Time of Day – The increase in overflight frequency was caused not only by an increased concentration of traffic, but also the growth in demand that has occurred since 2014. The increase in demand did play a role in East County communities' observations in increased aircraft overflights. As demand grew, so did the frequency of arrivals during certain hours that were typical for an airport that serves primarily final destination passengers. Scheduled SDIA arrivals began at 6:00 a.m. and peaked between 9:00 a.m. and 10:00 a.m. A second arrival peak occurred between 12:00 p.m. and 1:00 p.m. A third peak occurred between 3:00 p.m. and 6:00 p.m., and a fourth occurred between 7:00 p.m. and 11:00 p.m. This schedule pattern assisted in understanding East County communities' observations related to the timing of noise events. The ECWG was advised that addressing demand levels through restrictions was not a feasible measure for purposes of the traffic procedure evaluation and would require a 14 CFR Part 161 study, which would be extensive and time consuming, and it most likely would not lead to a successful conclusion based on previous efforts conducted by other airport sponsors.

---

[9] Class B airspace is generally controlled airspace from the surface to 10,000 feet mean sea level that is surrounding a busy airport in terms of airport operations or enplaned passengers. The configuration of each Class B airspace area is individually tailored, consists of a surface area and two or more layers, and is designed to contain all published instrument procedures once an aircraft enters the airspace. Pilots must have an air traffic controller to operate in the area, and all aircraft must have a Mode C transponder that provides location and altitude. Aircraft that are cleared to enter are provided radar separation services by FAA air traffic control within the airspace.

[10] US Department of Transportation, Federal Aviation Administration, Form 8260-1, *Flight Procedure Standards Waiver*, March 28, 2017.

EXHIBIT 3-1 RADAR FLIGHT TRACK DENSITY FOR ARRIVALS TO SDIA RUNWAY 27 – JULY 2016, NOVEMBER 2016, AND JULY 2017



SOURCES: San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Lower Aircraft Altitude – SDIA jet arrival altitudes from the northwest were evaluated, and findings were presented to the ECWG at the second meeting on January 24, 2019 (refer to Appendix A to review presentations provided at ECWG meetings). A gate (a window in space based on length and altitude) at the NADDO waypoint was defined in ANOMS to capture jet arrivals that go through the gate 6 nautical miles (NMs) east and west of the NADDO waypoint from the ground up to 10,000 feet above field elevation (AFE).[11] For July 2016 (prior to the BAYVU RNAV STAR change) and July 2018 (after the BAYVU RNAV STAR change), the average jet arrival altitude through the gate was 4,939 feet AFE and 4,861 feet AFE, respectively. The majority of arrivals captured through the gate were between 4,000 and 6,000 feet AFE for both July 2016 and July 2018. For both timeframes, some jet aircraft west of the NADDO waypoint location were as low as 3,000 feet AFE as aircraft turned south to join the final approach closer to the Airport. In summary, the average altitude, range of altitude, and location and frequency of jet aircraft below 4,000 feet AFE did not appear to change after the BAYVU RNAV STAR was implemented.

The notable difference between July 2016 and July 2018 was the concentration of traffic at specific locations along the distance of the gate. Although the range of altitudes are the same, the frequency of traffic entering the gate between 4,000 and 6,000 feet over communities near the NADDO waypoint location increased as a result of the change made to the BAYVU RNAV STAR and Runway 27 RNP approach. Just over half of the jet arrivals for July 2018 that went through the gate were located close to the NADDO waypoint location. Jet arrivals during July 2016 were more distributed along the gate. Therefore, the altitude over East County did not change, but the location where aircraft operate within the same altitude ranges has changed. This type of change can be noticeable by communities, and it appears to coincide with observations shared by some ECWG members.

[11] The airfield elevation for SDIA is 16.8 feet mean sea level.

4. NOISE REDUCTION OBJECTIVES

At the second ECWG meeting on January 24, 2019, three approaches to abate or reduce aircraft noise exposure through standard flight procedure design were presented:

- Move the flight procedure route location – define standard flight procedure routes that direct aircraft over more noise-compatible areas to abate aircraft noise exposure from residential and/or other noise-sensitive areas
- Raise the altitude along the flight procedure route – define the standard flight procedure route that raises altitude over communities to reduce noise levels
- Disperse or concentrate flight patterns based on type of procedure – define the standard flight procedure route to spread flight patterns over a large area to provide reduced frequency over a specific area or to provide a repeatable route that keeps all aircraft over a more compatible area to abate noise exposure from residential and/or noise-sensitive areas

Move the Flight Procedure Route Location – Based on a review of existing land use for East County communities, Ricondo determined there were limited land use opportunities to focus flight patterns over more compatible areas. Open space was available east of State Route (SR) 54 (i.e., San Diego National Wildlife Refuge), but relocating a flight procedure further east will impact other existing flight procedures for SDIA and other airports (i.e., Montgomery Field). The existing RNAV RNP Z Runway 27 approach directs aircraft just east of SR 54 and was discussed with the ECWG as an example to direct aircraft on a route that turns aircraft south over a more compatible area. ECWG members indicated concerns with the concentration effect over communities such as La Mesa, Casa de Oro, and Mount Helix if all arrivals from the northwest were assigned the RNAV RNP Z Runway 27 approach, but the ECWG is open to continued use of the procedure as long as all jet arrivals were not using the procedure.

Raise Altitudes on Procedure Routes – SDIA arrivals from the northwest ultimately need to merge to the final approach to Runway 27. Ricondo presented the required altitudes aircraft must be at along the descent on the straight-in final approach at the January 24, 2019, ECWG meeting. The closer an aircraft is to the Airport when merging on the final approach, the lower the altitude needs to be when intercepting the final approach. Prior to turning south to join the final approach, aircraft are on an easterly heading approximately 4 NMs north of the final approach. An aircraft should descend at a rate that is not too steep in order to ensure a stabilized approach. This means aircraft on the easterly heading cannot be at an altitude too high. Therefore, opportunities to raise arrival altitudes higher than the existing flight procedure altitudes over East County were limited, but the potential to reduce the frequency of aircraft below existing flight procedure altitudes was considered feasible for further consideration.

Disperse or Concentrate Flight Patterns – Based on current traffic patterns, the majority of jet arrivals to Runway 27 from the northwest were dispersed as aircraft turn south to join the final approach; although, concentration does occur over areas such as La Mesa when aircraft operate on the COMIX TWO RNAV STAR between the KLOMN and NADDO waypoints. Approximately 20 to 25 percent of jet arrivals operated on the RNAV RNP Z Runway 27 approach in 2018, which also concentrates traffic over the communities. The RNAV RNP Z Runway 27 approach directs traffic east after the KLOMN waypoint and turns aircraft south at the ADAJE waypoint located within the Casa de Oro area on a path that directs aircraft over the San Diego Wildlife Refuge area just east of the Lakeview at Highlands Ranch community and turns aircraft west over the Sweetwater Reservoir. Members of the ECWG understand the advantage of turning traffic south over more compatible areas, but they were concerned about the concentration over

communities like La Mesa and Casa de Oro as aircraft head east and begin the turn south. Based on input provided by the ECWG at the January 24, 2019, meeting, dispersion was a preferred method to abate noise for East County versus a concentrated path that would benefit some communities, but also impact others.

Considering the complexity involved in managing arrivals to Runway 27 and the concerns indicated by members of the ECWG, the following objectives were established, which considered flight procedure modifications or additions aimed at reducing noise exposure over East County:

- Raise the altitude of arrivals from the northwest to Runway 27 on the downwind flight pattern (when aircraft are proceeding east before turning south to join the final approach). This objective can be accomplished by either raising altitude requirements on a procedure or increasing the frequency of aircraft at or above current altitude requirements on existing procedures.
- Maintain dispersion as aircraft proceed downwind and turn south over residential areas. This objective can be accomplished by procedure designs that do not include an RNAV-based route; it relies primarily on air traffic controller direction.
- Turn aircraft south to join the final approach over less populated areas. This objective can be accomplished by extending arrivals further east (up to the Casa De Oro area) prior to turning south, so aircraft operate over a more compatible area prior to joining the final approach to Runway 27.

Ricondo relied upon these objectives to aid in identifying traffic procedure concepts. Section 5 describes the concepts and evaluation results.

5. FLIGHT PROCEDURE EVALUATION

Because this report often refers to ATC, it is important to understand the ATC requirements. Appendix A of the *San Diego International Airport Air Traffic Flight Procedure Evaluation Report* provides basic background information on the National Airspace System (NAS) and ATC. The information includes a description of the NAS, the role of ATC, the aircraft flow within the NAS, the type of ATC facilities, ATC requirements, and the FAA's Next Generation Air Transportation System (NextGen) program.

Ricondo conducted the traffic procedure evaluation on the design concepts using the same techniques applied by the FAA during the Preliminary Activities phase described in FAA Order 7100.41A. The primary tasks were as follows:

- Determine the justification for procedure based on ECWG objectives.
- Become familiar with existing traffic flows, procedures, and airspace boundaries.
- Determine constraints related to the safe and efficient movement of aircraft.
- Develop conceptual PBN RNAV procedures using the FAA's Terminal Area Route Generation Evaluation and Traffic Simulation (TARGETS) software (applicable to new flight procedure concepts or modifications to existing procedures).
- Determine if a proposed change meets or conflicts with the FAA's goals and objectives.
- Evaluate potential benefits related to the justification for a procedure.

Ricondo evaluated RNAV procedure design concepts in a manner similar to the first phase detailed in FAA Order 7100.41A.[12] Ricondo did not have access to the specific safety data sources identified in the criteria, but the consultant relied upon FAA ATO Airspace and Procedures subject matter experts to provide input and feedback on the proposed concepts to qualitatively identify potential safety and air traffic management issues. Because of the terrain and obstructions located in East County, the evaluation did include an obstruction analysis using the FAA's TARGETS PBN design software. The designs developed for this evaluation are conceptual in nature and could be subject to change during the FAA's design process as a result of more detailed analysis, such as additional obstruction analysis, safety risk assessments, airline flight simulations, environmental screening assessments, flight check, charting, and/or additional stakeholder engagement and feedback.

Ricondo conducted the evaluation in three phases: Preliminary Draft Design Concept, Draft Design Concept, and Final Design Concept. The phased approach provided stopping points to collect input from the ECWG. Stopping at each phase to review the concept designs served as a means to ensure the design concepts not only met the ECWG's intent of reducing noise exposure, but also identified potential issues related to safety, efficiency, operation procedures, aircraft capabilities, and/or land use compatibility. Ricondo collected input from ECWG members after each meeting and considered the input to determine potential refinements and, ultimately, a final design recommendation. **Appendix B** contains all the written input submitted by the ECWG members and the responses drafted by Ricondo throughout the process.

[12] US Department of Transportation, Federal Aviation Administration, Order 7100.41A, *Performance Based Navigation Implementation Process*, April 28, 2016.

The following subsections provide more detailed information regarding the Flight Procedure Evaluation process related to the roles and responsibilities for each stakeholder and the flight procedure concept design constraints and requirements.

5.1 ROLES AND RESPONSIBILITIES

The Flight Procedure Evaluation process for East County involved a diverse set of stakeholders with different roles, responsibilities, and interests in the outcomes of the evaluation. This section identifies the various key stakeholders and describes their roles and responsibilities.

5.1.1 SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

As the operator of SDIA, the Authority is the sponsor of the Flight Procedure Evaluation project and has the overall responsibility for the conduct of the evaluation. The Authority contracted Ricondo, developed the Scope of Work, and funded the evaluation. By virtue of its role on this evaluation, the Authority was the final decision-maker regarding all aspects of the project, including the execution of the project; the coordination in forming the ECWG; the flight procedure concepts to be included in the evaluation; and the appropriate direction to take related to next steps. The Authority will consider Ricondo's final recommendations and stakeholder input from the ECWG when deciding on an appropriate level of effort and the next steps at the conclusion of the evaluation.

The Authority does not have legal authority to regulate air traffic procedures. Through federal law, Congress has essentially preempted airports, states, and local governments from regulating (a) the price, route, and service of air carriers; (b) the use of airspace and airspace management; and (c) aircraft noise. These laws are as follows: Federal Aviation Act of 1958, as amended (Pub. L. No. 85-726, 72 Stat. 731 49 U.S.C., § 0103[b][1]&[2]); Noise Control Act of 1972 (49 U.S.C. §§ 44709, 44715); Airline Deregulation Act of 1978 (ADA; 49 U.S.C. 41713[b]); Airport Noise and Capacity Act of 1990 (ANCA; 49 U.S.C. § 47521 et. seq; 14 Code of Federal Regulations Part 161); and Aviation Safety and Noise Abatement Act of 1979 (ANSA; 49 U.S.C. § 40116, 46505, 47501 et seq.).

"Federal preemption" is a legal concept based on the Supremacy Clause in the US Constitution (Article VI, Clause 2). It applies when Congress evidences an intention to exercise broad federal control in a particular area. Today, airport sponsors are preempted from controlling or regulating aircraft in flight, regulating early turns, mandating departure headings or altitude, restricting access to an airport based on aircraft type, and adopting noise curfews. SDIA, however, is one of a few unique airports in the United States that operates with a night noise curfew (no departures between 11:30 p.m. and 6:30 a.m.), because its curfew was adopted prior to the passage of ANCA in 1990; therefore, the Airport is grandfathered by law.

Under the federal laws previously cited, Congress has vested the US Department of Transportation, FAA with the plenary power to regulate aircraft, as well as the use of airspace, departure headings, aircraft altitudes, air carrier routes, airline services, aircraft noise, aircraft safety, and more.

5.1.2 EAST COUNTY WORKING GROUP

The Authority determined input from the ECWG on the evaluation of flight procedures intended to address noise concerns in East County would be critical and beneficial to the process. The primary role for the ECWG was to advise the Authority on the aircraft noise concerns and the overall objectives focused on providing relief. The Authority relied upon ECWG members to represent the interests and concerns of the communities each member represented and to communicate information shared at meetings with interested parties in their communities.

The ECWG's role in the Flight Procedure Evaluation was advisory only; the ECWG could offer opinions, advice, and guidance, but the Authority had the sole discretion to accept or reject the ECWG recommendations in accordance with FAA air traffic regulations, procedure design criteria, and other requirements described in Section 5.2, which were shared and discussed with the ECWG at the beginning of the process at the first and second meetings held on December 6, 2018, and January 24, 2019.

5.1.3 FEDERAL AVIATION ADMINISTRATION AIR TRAFFIC ORGANIZATION

The FAA's role related to air traffic and airspace management is summarized in FAA Job Order 7100.2L, *Procedures for Handling Airspace Matters*: "The navigable airspace is a limited national resource that Congress has charged the Federal Aviation Administration (FAA) to administer in the public interest as necessary to ensure the safety of aircraft and its efficient use."[13] Authorized by Congress, the FAA has legal authority to regulate matters related to airspace use, air traffic management, and air traffic procedures. The FAA ATO was regulated to handle all matters related to airspace and air traffic.

The FAA ATO agreed to provide the Authority with ongoing assistance on this evaluation in a technical advisory role, but it could not provide formal determination on feasibility until a procedure request was submitted for FAA review. The FAA provided an ex-officio representative who was available to meet with the Authority and Ricondo as needed to provide subject-matter-expert general and nonbinding input on proposed design concepts. If the Authority decided to submit proposed concepts to the FAA ATO for consideration, then the FAA would conduct its internal process described in FAA Order 7100.41A. The FAA has sole authority to determine if a proposed measure is considered "feasible." The FAA would begin a formal process of review after a proposed procedure is submitted by a project sponsor.

5.1.4 MEMBERS OF THE PUBLIC

ECWG meetings were open to the general public to observe discussions; members of the general public were encouraged to speak to their local ECWG representative.

5.2 DEFINE REQUIREMENTS

The Flight Procedure Evaluation process was guided by two primary requirements that a design concept must meet: (1) achieve ECWG objectives to reduce SDIA jet arrival noise; and (2) be feasible to advance through the first step in the FAA ATO's PBN implementation process. ECWG objectives were previously described in Section 4. The following subsections summarize the flight procedure evaluation parameters used to consider feasibility.

5.2.1 CONCEPT DEVELOPMENT PARAMETERS

Multiple design parameters were applied to evaluate viable flight procedure concepts that would follow FAA ATO safety, efficiency, and environmental requirements. The general parameters were:

- Do not reduce safety.
- Do not reduce capacity of SDIA.

[13] US Department of Transportation, Federal Aviation Administration, Job Order 7400.1L, Changes 1 and 2, *Procedures for Handling Airspace Matters*, https://www.faa.gov/documentLibrary/media/Order/7400.2L_Bsc_w_Chgs_1-2_dtd_3-29-18.pdf (accessed September 5, 2018).

- Do not change aircraft flight paths[14] over areas exposed to CNEL at or higher than 65 dB.
- Meet FAA PBN procedure design criteria.
- Fit within existing airspace boundaries.
- Be sensitive to moving noise to new noncompatible areas to reduce noise over a community.

Table 5-1 presents additional information related to each parameter.

5.2.2 FEDERAL AVIATION ADMINISTRATION MISSION AND GOALS

A feasible procedure would not only be developed in accordance with the criteria discussed in Section 5.2.1, but also be consistent with the FAA's mission and goals. The primary objective of the East County Flight Procedure Evaluation was to identify conceptual procedure designs that had a likelihood of advancing through the FAA's first phase of the PBN procedure implementation process, as described in FAA Order 7100.41A. The first phase in the FAA process, the Preliminary Activities phase, examines current operations, develops a concept, evaluates potential environmental issues, and determines expected benefits. Based on the information collected in the first phase, the FAA would determine if the request should proceed through the development and implementation process based on the FAA's mission and goals. FAA Order 7100.41A does not describe the FAA's mission and goals. Therefore, Ricondo evaluated publicly available information to qualify the FAA's mission and goals and considered the information during the evaluation process. The following information describes findings related to the FAA's mission and the organizational process it uses to achieve its ultimate mission.

The FAA's mission is "to provide the safest, most efficient aerospace system in the world."[15] In all lines of business within the FAA, the primary mission is at the forefront. This holds true related to air traffic procedures and noise abatement, as described in 14 CFR Part 150.35, paragraph (b)(3):

> "Those aspects of programs relating to the use of flight procedures for noise control can be implemented within the period covered by the program and without—
>
> (i) Reducing the level of aviation safety provided;
>
> (ii) Derogating the requisite level of protection for aircraft, their occupants and persons and property on the ground;
>
> (iii) Adversely affecting the efficient use and management of the Navigable Airspace and Air Traffic Control Systems; or
>
> (iv) Adversely affecting any other powers and responsibilities of the Administrator prescribed by law or any other program, standard, or requirement established in accordance with law."[16]

[14] FAA standard procedures refer to a line between two fix points (e.g., waypoints, fixes, or navigational aids) as a "route." FAA standard procedure plates depict the defined route. Procedure design may not translate to an aircraft located exactly on the route, especially if the route involves turns. For purposes of this evaluation, the expected location of an aircraft on a standard procedure is referred to as a "path." Differences between the definitions for "route" and "path" are applied to avoid confusion between the FAA's definition of a route and where aircraft are expected to be located.

[15] US Department of Transportation, Federal Aviation Administration, "Mission," April 23, 2010, https://www.faa.gov/about/mission/ (accessed September 11, 2018).

[16] 14 CFR 150.35

TABLE 5-1 (1 OF 2) CONCEPT DEVELOPMENT PARAMETERS DESCRIPTION

PARAMETER	DESCRIPTION	OUTSIDE OF PARAMETER EXAMPLES	APPLICABLE FAA ORDERS AND GUIDANCE
Do not reduce safety	The primary purpose of the air traffic control system is to prevent the collision of aircraft operating in the system. The priority of an air traffic controller is the safe separation of aircraft. Air traffic regulations and procedure design criteria are developed to provide a high level of safety. Any proposed changes to a procedure that do not meet air traffic regulations (e.g., aircraft separation), procedure design criteria, and/or obstruction clearance can cause safety risks, which would reduce the feasibility of a proposed concept and would be outside the parameter.	▪ A procedure that does not provide 3.0 nautical miles (NMs) lateral separation and/or 1,000 feet mean sea level (MSL) vertically from another procedure. ▪ A procedure that requires a descent or climb rate above maximum levels stated in procedure design criteria and/or requires all available means by pilots to descend and slow down at the same time (e.g., use of speed brakes). ▪ A procedure that converges or conflicts with another procedure. ▪ Two procedures sharing a common route but designed differently. ▪ A procedure design that creates a new safety risk.	▪ Federal Aviation Administration (FAA) Order 7110.65, *Air Traffic Control* ▪ FAA Order 7210.632, *Air Traffic Organization Occurrence Reporting* ▪ FAA Order 8040.4, *Safety Risk Management Policy* ▪ FAA Order 8260.19, *Flight Procedures and Airspace* ▪ FAA Order 8260.3, *United States Standard for Terminal Instrument Procedures (TERPS)* ▪ FAA Order 8260.46, *Departure Procedure (DP) Program* ▪ FAA Order 8260.58, *United States Standard for Performance Based Navigation (PBN) Instrument Procedure Design*
Do not reduce SDIA capacity	San Diego International Airport's (SDIA's) airfield acceptance rate for departures and arrivals shall not be impacted by any proposed procedure concepts.	▪ A procedure design that requires all Runway 27 departures to take off on one heading instead of two divergent headings will reduce the acceptance rate for departures per hour. ▪ A procedure design that requires increased separation between aircraft on arrival will reduce the acceptance rate for landings per hour.	▪ FAA Order 7110.65, *Air Traffic Control*
Do not change flight paths over areas exposed to CNEL 65 dB or higher	A change in noise exposure for areas exposed to levels at or higher than Community Noise Exposure Level (CNEL) 65 decibels (dB) can be considered a significant impact, depending on the degree of change; this can also create potential land use compatibility impacts. Such impacts could require an Environmental Impact Statement (EIS) and could cause significant extraordinary circumstances, such as public controversy. This substantially impacts the feasibility of a proposed concept, and any such action should be evaluated as part of the Title 14 Code of Federal Regulations (CFR) Part 150 study process.	▪ A change to initial departure headings from Runway 9 or Runway 27. ▪ A change to the final approach in close proximity to SDIA.	▪ FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* ▪ FAA Order 7400.2M, *Procedures for Handling Airspace Matters*, Chapter 32, "Environmental Matters"
Meet FAA PBN procedure design criteria	All concept procedures must meet PBN design criterial requirements, as documented in FAA Orders and guidelines.	▪ Flyability failures based on the FAA's Terminal Area Route Generation Evaluation and Traffic Simulation (TARGETS) PBN procedure design tool. ▪ Distance requirements between two waypoints based on route geometry (e.g., 180-degree turns). ▪ Exceeding maximum descent rates or climb rates.	▪ FAA Order 8260.58, *United States Standard for Performance Based Navigation (PBN) Instrument Procedure Design* ▪ FAA Order 8260.3, *United States Standard for Terminal Instrument Procedures (TERPS)*

TABLE 5-1 (2 OF 2) CONCEPT DEVELOPMENT PARAMETERS DESCRIPTION

PARAMETER	DESCRIPTION	OUTSIDE OF PARAMETER EXAMPLES	APPLICABLE FAA ORDERS AND GUIDANCE
Fit within existing airspace boundaries	Controlled airspace is managed by breaking up the airspace into multiple sectors assigned to an air traffic controller. Every effort should be made to ensure procedure concepts do not require a change in sector boundaries; keep aircraft within the appropriate sector; and stay at least 1.5 NMs laterally and/or 1,000 feet MSL vertically from neighboring sector boundaries to ensure safe separation. In addition, SDIA operations must stay within the Class B airspace.[1] All procedure concepts must ensure SDIA operations stay within the controlled Class B airspace boundaries.	▪ A procedure that leaves the Class B boundary. ▪ A procedure design that is within 1.5 NMs from a neighboring air traffic control sector. ▪ A procedure design that changes location where an air traffic controller transitions control over to another air traffic controller.	▪ FAA Order 7110.65, *Air Traffic Control* ▪ Standard Operating Procedures for Los Angles Air Route Air Traffic Control Center (ZLA ARTCC) ▪ Standard Operating Procedures for Southern California Terminal Radar Approach Control (SCT TRACON) ▪ Letter of Agreements between SCT TRACON and ZLA ARTCC
Be sensitive to moving noise to new noncompatible areas to reduce noise over a community	If the purpose and need of a procedure design is to reduce noise over a community, then every effort should be made not to cause an increase in noise for other communities, especially those not represented by the Citizen Advisory Committee (CAC), or cause other environmental impacts as a result of moving a procedure, unless the affected communities are informed of the change and potential impacts.	▪ A PBN procedure design moved over communities that do not have a PBN procedure over the community causes a reportable and/or noticeable change in aircraft noise exposure.	▪ Environmental considerations: FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Section 4(f) resources: historic properties; environmental justice and/or extraordinary circumstances ▪ FAA Top Policy Issues: "FAA Authority regarding Noise: While the FAA has the authority to alter flight procedures based on noise, the Agency historically has not exercised that authority to prohibit aircraft flights over a particular area unless the operation is unsafe, or the aircraft is operated in a manner inconsistent with FAA regulations. This is because flight procedure changes can result in shifting of aircraft noise from one community to another. Any work regarding the movement of procedures is done for safety and efficiency reasons (including enhancing controller ability to monitor traffic)."[2]

NOTES:

1 Class B airspace is designated airspace from the surface to 10,000 feet MSL surrounding a busy airport, such as SDIA, in terms of airport operations or enplaned passengers. The configuration of each Class B airspace area is individually tailored, consists of a surface area and two or more layers, and is designed to contain all published instrument flight procedures once an aircraft enters the airspace. Air traffic control clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace

2 US Department of Transportation, Federal Aviation Administration, FAA Top Policy Issues, https://www.transportation.gov/transition/FAA/Top-Policy-Issues (accessed September 11, 2018).

SOURCE: Ricondo & Associates, Inc., November 2019.

The FAA's vision, which drives the goals or strategic initiatives identified by the FAA, states: "We strive to reach the next level of safety, efficiency, environmental responsibility and global leadership. We are accountable to the American public and our stakeholders."[17] Therefore, the FAA would evaluate a proposed procedure change to determine if a proposed procedure not only causes an adverse impact on the safe and/or efficient use of the navigable airspace, but also hinders its ability to further enhance the safe and efficient movement of aircraft. For example, the FAA is implementing PBN RNAV procedures to enhance the safe and efficient movement of aircraft, and any proposed change that removes or reduces the safety and efficiency gained by the implemented procedure would most likely be considered not meeting the FAA's goals. As a result, the likelihood of the FAA rejecting the proposed change would be high.

5.2.3 EAST COUNTY WORKING GROUP INPUT ON DESIGN AND EVALUATION PROCESS

Ricondo presented flight procedure evaluation parameters at the first and second ECWG meetings held on December 6, 2018, and January 24, 2019. The primary focus was to educate ECWG members on the parameters and methods applied by ATC to manage arrivals into SDIA in a safe and efficient manner, as well as to provide examples that would impact SDIA capacity. Ricondo described the process planned for the Flight Procedure Evaluation with an emphasis on the intent of the process to identify feasible flight procedure concepts—the process did not represent or replace the FAA ATO's PBN implementation process. Ricondo emphasized the FAA would provide access to subject matter experts as needed, but any input would not be considered formal input. The FAA would conduct an independent assessment and would provide formal input once a proposed procedure design is submitted by a project sponsor. Ricondo also provided an overview of the three-phase process during which Ricondo would report concepts to the ECWG and collect input from the members. ECWG input is summarized in the following sections describing the Preliminary Draft Design Concept, Draft Design Concept, and Final Design Concept phases of the process.

[17] US Department of Transportation, Federal Aviation Administration, "Mission," April 23, 2010, https://www.faa.gov/about/mission/ (accessed September 11, 2018).

6. PRELIMINARY DRAFT DESIGN CONCEPTS

The Preliminary Draft Design Concept phase involved three steps:

1. Conduct a baseline review of the existing air traffic environment around SDIA with FAA ATO Airspace and Procedures subject matter experts from the Los Angeles District and confirm any potential near-term changes to flight procedures.
2. Develop and design conceptual procedures using the FAA's TARGETS software, if necessary, for suggestions deemed viable and/or concept(s) that meet the intent of ECWG objectives.
3. Collect and review input from the ECWG on initial review findings and preliminary draft concepts to determine if adjustments are required and concepts meet the ECWG objectives.

The following subsections summarize the results for each of the three steps.

6.1 FEDERAL AVIATION ADMINISTRATION AIR TRAFFIC ENVIRONMENT – BASELINE REVIEW

On April 19, 2019, Ricondo and Authority staff met with the FAA ATO Airspace and Procedures subject matter experts for the Los Angeles District to provide the FAA an overview of ECWG aircraft noise concerns; to confirm the BAYVU 5 RNAV STAR change in November 2016; to identify any known near-term amendments or changes to existing SDIA arrival flight procedures to Runway 27; and to seek feedback from the FAA on any operational considerations and/or constraints related to the procedures subject for review for the East County Flight Procedure Evaluation. The FAA provided input related to the following:

- Overview of current SDIA standard operating procedures over East County:
  - COMIX RNAV STAR – arrivals from the northwest
  - LYNDI RNAV STAR – arrivals from the east
  - RNAV RNP Z Runway 27 approach
  - ATC clearance for visual approach
  - general heading and altitude adjustments to manage arrivals from the northwest to final approach
- Air traffic management requirements related to maintaining safe minimum separation standards:
  - Maintain 3 NMs lateral separation or 1,000 feet mean sea level (MSL) vertical separation until established on final approach.
  - If cleared for visual approach, the pilot is responsible to maintain safe separation, which may be less than 3 NMs.
  - The FAA manages several procedure constraints over East County related to Montgomery Field arrivals, arrivals to the south to Brown Field, missed approaches from Gillespie Field, arrivals to SDIA from the northwest and east, and SDIA departures heading east and northeast.
  - The FAA confirmed the critical need to issue radar-based headings, altitude, and speed adjustments to manage the complex traffic environment over East County.

- Implemented PBN RNAV procedures:
  - The FAA is open to discussion regarding noise abatement associated with procedure design, but it indicated concerns related to maintaining efficiencies gained by implementing PBN RNAV procedures.
  - Formal FAA input on proposed concepts would require submitting procedure to the FAA who will conduct the internal PBN procedure review process.
- BAYVU 5 RNAV STAR modification:
  - The FAA confirmed the reason for the change to the BAYVU 5 RNAV STAR to improve Class B containment.
  - The number of aircraft on an ATC-cleared visual approach exiting the Class B airspace floor was reduced as a result of the modification.
  - The route between the KLOMN and NADDO waypoints may no longer be needed if current FAA efforts to modify the Class B airspace are implemented.

The FAA indicated a willingness to provide feedback as requested during the process, and it remained open to feasible concepts that have a potential to reduce noise while not impacting the safe and efficient movement of traffic within the Southern California Terminal Radar Approach Control (SCT TRACON) airspace. As a result of the information provided at the meeting, Ricondo was able to formulate a good understanding of the current air traffic environment related to SDIA Runway 27 arrivals from the northwest.

6.2 PRELIMINARY DRAFT DESIGN CONCEPT SUMMARY

Five design concepts were evaluated in the Preliminary Draft Design Concept phase based on the ECWG concerns related to aircraft noise. **Table 6-1** lists the design concepts and indicates the findings based on the criteria described in Section 5.2. Table 6-1 includes criteria categories to identify the reason(s) why a design concept would not be carried forward to the next phase. If a design concept was eliminated from further consideration, then proposed design changes were considered based on input from the ECWG regarding potential alterations to the original design concept. **Appendix C** includes procedure design sheets for each design concept evaluated by Ricondo. Additional information related to each procedure design is included on each procedure design sheet.

TABLE 6-1 PRELIMINARY DRAFT DESIGN CONCEPT PHASE SUMMARY

DESIGN CONCEPTS	PASS TO DRAFT	ELIMINATE
COMIX RNAV STAR – Keep All Jet Arrivals at 6,000 feet up to NADDO Waypoint		**X (EO)**
COMIX RNAV STAR Amendment – Remove Route Between KLOMN and NADDO Waypoints	√	
Runway 27 RNP Approach – Increase Use		**X (EO)**
Runway 27 RNAV Visual Approach		**X (OF)**
Runway 27 RNAV Approach (Overlay of Runway 27 RNP Approach)		**X (EO)**

NOTES:
RNAV – Area Navigation
RNP – Required Navigation Performance
STAR – Standard Terminal Arrival Route
Waypoint – a predetermined geographical position that is defined in terms of latitude/longitude coordinates. A waypoint is most often used to indicate a change in direction, speed, or altitude along the desired path. RNAV procedures make use of both fly-over and fly-by waypoints.
EO – East County Working Group Objective – the concept does not adequately meet objectives, or conflicts with, ECWG objectives.
OF – Operational Feasibility – the concept presents constraints to the airfield's capacity, the efficient use of the airspace, the FAA's ability to meet its mission and goals, and/or the airline/air traffic controller's ability to comply with the procedure consistently or their willingness to request the procedure.
SOURCE: Ricondo & Associates, Inc., August 2019.

Of the five concepts evaluated, one was passed to the next phase and four were eliminated from further consideration. Of the four eliminated, three were eliminated based on ECWG input related to meeting objectives. One, the charted RNAV visual approach procedure, was eliminated based on expected low use of the procedure due to pilot preference for PBN procedures. One of the four design concepts eliminated, the RNAV approach, was modified based on ECWG input, and it was evaluated in the Draft Design Concept phase.

6.3 PRELIMINARY DESIGN CONCEPTS REVIEW AND INPUT

The design concepts and evaluation findings were presented to the ECWG on May 28, 2019, and July 25, 2019. This section summarizes the input provided by ECWG members.

At the third ECWG meeting on May 28, 2019, ECWG members indicated concerns related to concentrating traffic over specific areas and would prefer dispersion. Maintaining the COMIX RNAV STAR between the KLOMN and NADDO waypoints, increasing the use of the Runway 27 RNP approach, and designing an RNAV approach to overlay the RNAV RNP Z Runway 27 approach to increase the use of the path would maintain and increase traffic concentration. The combination of the three design concepts did not meet the ECWG's objective to maintain dispersion. ECWG members indicated use of the RNAV RNP Z Runway 27 approach is useful in providing some respite, but they did not support the use of the procedure as the primary approach for jet arrivals from the northwest.

An ECWG member, who was an experienced airline pilot, indicated at the meeting and in post-meeting comments the pilot preference for RNAV procedures over published visual approach procedures. Visual approaches such as the design concept visual approach proposed in the Preliminary Draft Design Concept phase require pilot responsibility of traffic separation, terrain clearance, and staying within the confines of the Class B airspace, while calculating how best to get on the proper descent profile. This increases the pilot workload. Visual approaches are also notorious for causing a higher potential for unstable approaches (i.e., intercepting the final approach above the required descent path or passing the straight-in approach path). Due to reduction in pilot workload and predictability, pilots typically prefer an RNAV-based approach. Appendix B includes post-meeting comments from ECWG members.

ECWG members understood the need for ATC to issue headings and altitudes to efficiently manage the merge of arrivals from multiple directions to a final approach path, but during low demand periods when traffic management is not as complex, ATC will still descend aircraft to 5,000 feet MSL along the downwind path and clear pilots for a visual approach to join the final approach closer to SDIA. An ECWG member suggested evaluating an RNAV approach that would direct aircraft further east and to turn south over less populated areas during low demand periods. The procedure would keep aircraft higher compared to current patterns, and aircraft would fly over less populated areas as they descend to a lower altitude to join the final approach. The ECWG understood Ricondo's concerns related to traffic conflicts with arrivals from the east but proposed it as a concept when arrival demand levels are low. The design concept was planned to be presented to the FAA for cursory feedback.

The ECWG also recommended to keep aircraft at 6,000 feet MSL at the KLOMN waypoint with controlled vectors after the waypoint to direct pilots to join the final approach. This could be conducted when ATC does not need flights from the northwest to conduct a turn to intercept the final approach just prior to the REEBO intersection or approximately 6 NMs from Runway 27. Aircraft would still be descending after the KLOMN waypoint, but they would be quieter compared to aircraft at or below 5,000 feet MSL at or near the KLOMN waypoint. This concept would involve modifying the COMIX RNAV STAR by removing the NADDO waypoint ending the procedure at the KLOMN waypoint at 6,000 feet MSL.

In general, the ECWG proposed an arrival management concept that would involve the two elements previously described and the current methods used by ATC during high demand periods. The concept emphasizes use of the proposed RNAV approach during low arrival demand periods (i.e., between 11:00 p.m. and 7:00 a.m.); it would keep jet arrivals from the northwest at 6,000 feet MSL at the KLOMN waypoint (as defined in existing COMIX RNAV STAR) when arrivals demand from the east and south are not high; and it would conduct current air traffic management techniques (i.e., descend arrivals to 5,000 feet MSL to accommodate the ability to join final approach closer to the REEBO intersection) when arrival demand is high. The concept would maintain dispersion, increase the frequency of aircraft at higher altitudes, and provide respite for populated areas.

Based on ECWG input, the following proposed Preliminary Draft Design Concept phase concepts were eliminated:

- Runway 27 RNAV Visual Approach – This concept was eliminated based on input provided by the ECWG airline pilot member related to the expected low use of the procedure due to the increased pilot workload and the potential increase in likelihood for an unstable approach.
- COMIX RNAV STAR – Keep All Jet Arrivals at 6,000 feet up to NADDO Waypoint – This design would maintain a concentrated flight path between the KLOMN and NADDO waypoints. ECWG preference was to provide dispersion after the KLOMN waypoint. The design concept to eliminate the KLOMN to NADDO route was carried forward to the Draft Design Concept phase, and it calls for aircraft to stay at or above 6,000 feet MSL at the KLOMN waypoint.
- RNAV RNP Z Runway 27 Approach – Increase Use – This concept was eliminated based on ECWG recommendation to maintain dispersion. The emphasis on increasing use of the existing Runway 27 RNP approach would increase concentration noise effects over East County communities. Maintaining the approach was carried forward to the Draft Design Concept phase, but emphasizing the increased use was eliminated.
- RNAV Runway 27 Approach (Overlay of RNAV RNP Z Runway 27 Approach) – This concept was eliminated based on the ECWG recommendation to maintain dispersion. The intent of this design concept was to increase use of the flight path defined by the RNAV RNP Z Runway 27 approach. Because the overall aircraft equipment requirements and pilot authorization for an RNAV approach is less restrictive compared to an RNP approach, the intent was to design a procedure that would allow more flights to operate along the RNP path. This would increase the noise effect caused by an increase in concentration, which conflicts with the ECWG's objectives. For the Draft Design Concept phase, Ricondo evaluated a refined version of an RNAV approach that directs aircraft further east prior to turning south, as proposed by an ECWG member.

7. DRAFT DESIGN CONCEPTS

The Draft Design Concept phase involved two steps:

1. Develop and design conceptual procedures, if required, using the FAA's TARGETS software based on ECWG input from the Preliminary Draft Design Concept phase.
2. Collect and review input from the ECWG on initial findings to determine if adjustments are required or the recommendation should no longer be considered based on design parameters and/or ECWG objectives.

Two procedure design concepts were evaluated based on the Preliminary Draft Design Concept phase evaluation results and ECWG input. One was carried over from the Preliminary Draft Design Concept phase, and the second was designed to address ECWG input on directing jet arrivals from the northwest further east prior to turning south to join the final approach. The procedure design concepts were as follows:

- One design concept carried over from the Preliminary Draft Design Concept phase:
  - Modification to COMIX RNAV STAR – Remove Route Between KLOMN and NADDO Waypoints
- One new approach procedure design concept requested by the ECWG:
  - Runway 27 RNAV Approach – Extend Approach East and Join at VYDAA waypoint (11:00 p.m. to 7:00 a.m.)

The two proposed procedures would be added to FAA ATC's procedure options (i.e., RNAV RNP Z Runway 27 approach, ATC radar vectors, or ATC clearance for visual approaches) to aid in managing jet arrivals and dispersing noise exposure levels throughout a typical day.

7.1 DRAFT DESIGN CONCEPT RESULTS SUMMARY

Table 7-1 lists the design concepts and the findings based on criteria described in Section 5.2 and input from the ECWG. Refer to the procedure design sheets in Appendix C for more detail on the draft procedure designs and evaluation results. A modification to the COMIX RNAV STAR to remove the route between the KLOMN and NADDO waypoints was determined to be feasible as long as the FAA can identify an alternative to ensuring Class B containment. One alternative currently under consideration by the FAA is an independent effort by the FAA to modify the Class B airspace and lower the airspace floor where the KLOMN waypoint is located. The COMIX RNAV STAR currently requires aircraft on the procedure to be at or above 6,000 feet MSL at the KLOMN waypoint; therefore, no change was required to keep aircraft at the proposed altitude. Increasing the frequency of aircraft at or above 6,000 feet MSL at or near the KLOMN waypoint would require encouragement of FAA controllers to keep jet arrivals on the COMIX RNAV STAR as much as possible or maintain altitude assignments at or above 6,000 feet MSL near the KLOMN waypoint when ATC radar vectors are required.

Based on TARGETS analysis, Ricondo determined the proposed new approach procedure design to extend arrivals east and join the final approach at the VYDAA waypoint would not meet FAA PBN design criteria due to the length of the intermediate segment (segment from the KLOMN waypoint to a point where the procedure joins the final approach) exceeding 15 NMs in length at a distance more than 15 NMs from the Airport reference point (a reference point on the airfield). Therefore, a refined design that meets design criteria and joins the final approach as close to VYDAA as possible was proposed. Based on a preliminary review of the concept with the FAA, the procedure conflicts with the Montgomery Field approach procedure, and SDIA arrivals from the east were a concern but were not considered to be an unmanageable situation, as long as arrival demand was low (i.e., arrival demand levels between

11:00 p.m. and 7:00 a.m.). The FAA reserved final determination until the proposed design concept was formally submitted and evaluated through the FAA PBN process, which would include an in-depth safety management system assessment. The FAA indicated it may be possible that a means to manage the procedural conflicts may not be feasible, but it cannot confirm this until it conducts the formal PBN process.

TABLE 7-1 DRAFT DESIGN CONCEPT PHASE SUMMARY

ALTERNATIVE DESIGN CONCEPTS	PASS TO FINAL	ELIMINATE
Modification to COMIX RNAV STAR – Remove Route Between KLOMN and NADDO Waypoints and Keep Jet Arrivals at 6,000 feet MSL at KLOMN	√	
Runway 27 RNAV Approach – Extend Approach East and Join at VYDAA Waypoint (11:00 p.m. to 7:00 a.m.)		**X (DC)**
Runway 27 RNAV Approach (Version 2) – Extend Approach East and Join Near VYDAA Waypoint (11:00 p.m. to 7:00 a.m.)	√	

NOTES:
RNAV – Area Navigation
MSL – Mean Sea Level
STAR – Standard Terminal Arrival Route
Waypoint – a predetermined geographical position that is defined in terms of latitude/longitude coordinates. A waypoint is most often used to indicate a change in direction, speed, or altitude along the desired path. RNAV procedures make use of both fly-over and fly-by waypoints.
DC – Design Criteria – the concept does not meet Federal Aviation Administration performance-based navigation design criteria.
SOURCE: Ricondo & Associates, Inc., August 2019.

The two design concepts, Modification to the COMIX RNAV STAR and the Runway 27 RNAV Extended Approach and join the final approach near the VYDAA waypoint, were passed to the Final Design Concept phase based on input provided by the ECWG and FAA. The two design concepts, in addition to the existing Runway 27 RNP approach and current FAA radar vector procedures, were intended to be available to FAA ATC to provide noise relief without impeding the FAA's ability to safely and efficiently manage jet arrivals from the northwest. As demand allows, the two proposed design concepts provide more opportunities to disperse arrivals, increase the frequency of higher altitudes along the downwind path, and provide respite during nighttime hours.

7.2 DRAFT DESIGN CONCEPT RESULTS REVIEW AND INPUT

The alternative design concepts and initial findings were presented to the ECWG on July 25, 2019 (ECWG Meeting #4) and were reviewed with the FAA ATO Airspace and Procedures representative for the Los Angeles District on August 15, 2019. Refer to Appendix A to review presentations provided at ECWG meetings. The following subsections summarize the input provided by ECWG members and the FAA.

7.2.1 EAST COUNTY WORKING GROUP INPUT

The following summarizes the input provided by the ECWG. Members did not provide any written comments after the meeting on July 25, 2019.

The ECWG member who was an experienced airline pilot emphasized pilot workload impacts when operating a visual approach and pilot preference for a predictable path provided by PBN technology (i.e., RNAV procedure and aircraft flight management systems). Ricondo recommended the elimination of the RNAV visual approach concept based on the airline pilot's input.

The concept design and intent for the extended RNAV approach to Runway 27 was reviewed with the ECWG. The intent of the extended RNAV approach to provide respite during low demand periods between 11:00 p.m. and 7:00 a.m. was confirmed by the ECWG. The ECWG understood the design criteria constraints related to the original

design concept that it proposed and accepted the proposed refinement to the approach to meet PBN design criteria. The ECWG was also briefed on potential concerns related to conflicts with other existing procedures, such as the Montgomery Field approach and SDIA arrivals from the east. The ECWG was informed of plans to meet with FAA ATO to discuss the design and potential concerns related to existing procedure conflicts. If FAA ATO indicates no critical flaws to the design, then the extended RNAV approach design concept would proceed forward in the Final Design Concept phase.

The ECWG emphasized the importance of dispersion and keeping aircraft at or above 6,000 feet MSL near the KLOMN waypoint as much as possible. Ricondo recommended eliminating the design concept that would keep jet arrivals from the northwest at 6,000 feet MSL at the NADDO waypoint, because it would maintain traffic concentration between the KLOMN and NADDO waypoints. As an alternative, a modification to the existing COMIX RNAV STAR was recommended. The proposed modification removes the route between the KLOMN and NADDO waypoints with an emphasis for FAA ATC to keep jet arrivals at or above 6,000 feet MSL at or near the KLOMN waypoint. This is consistent with the design concept proposed in the Preliminary Draft Design Concept phase.

The ECWG's experienced airline pilot member emphasized the intent of the multiple procedures (i.e., modified COMIX RNAV STAR, current RNAV RNP Z Runway 27 approach, proposed extended RNAV Runway 27 approach, FAA ATC clearance for visual approaches, and FAA ATC radar vectoring) to serve as options for FAA ATC to manage traffic with noise relief in mind. The ECWG was advised of the complexities related to associating the use of a procedure with demand, and success would depend primarily on encouraging the FAA to keep jet arrivals from the northwest at or above 6,000 feet MSL near the KLOMN waypoint as much as possible and to assign jet arrivals to the extended RNAV approach between 11:00 p.m. and 7:00 a.m.

The ECWG was also advised on the elimination of the concept emphasizing increased use of the existing RNAV RNP Runway 27 approach and the proposed RNAV Runway 27 approach that overlays the RNP approach path. Both conflict with the ECWG's objective to maintain dispersion. The ECWG was informed on the continued use of the RNAV RNP Z Runway 27 approach and expected an increase in use in the long term as the FAA's NextGen continues to evolve. Any recommendations from this evaluation would not emphasize increased use of the RNAV RNP Z Runway 27 approach.

7.2.2 FEDERAL AVIATION ADMINISTRATION AIR TRAFFIC ORGANIZATION AIRSPACE AND PROCEDURE REVIEW

An overview of the ECWG objectives and the draft design concepts was conducted with a representative from FAA ATO Airspace and Procedures on August 15, 2019. The presentation emphasized that a single draft concept was proposed, which was comprised of multiple arrival procedures available to the FAA to keep aircraft higher and dispersed as demand levels permit. Based on review of the draft design concepts for the proposed RNAV approach to Runway 27 that extends further east, the FAA concurred with findings related to procedure conflicts; however, the official FAA PBN review process may identify potential management solutions as long as the proposal is applicable between 11:00 p.m. and 7:00 a.m. when arrival demand is low. The FAA also acknowledged the potential feasibility for eliminating the KLOMN to NADDO route for the COMIX RNAV STAR, especially if the FAA implements the current Class B airspace proposal. The FAA indicated the management in targeted use of the multiple arrival procedures based on specific levels of demand was not feasible due to the complexity involved in merging aircraft from multiple directions to a single-runway final approach. The FAA indicated any final input related to the proposed design concepts will require submittal to the FAA Instrument Flight Procedure gateway to begin the formal FAA PBN review process. Based on the feedback provided by the FAA ATO Airspace and Procedures representative, no design concepts were eliminated or required refinements.

8. FINAL DESIGN CONCEPT

The Final Design Concept phase involved four steps:

1. Refine, if necessary, conceptual procedures passed in the Draft Design Concept phase.
2. Conduct noise screening analysis on final design concepts.
3. Collect and review input from the ECWG on noise screening results and initial recommendations.
4. Finalize recommendations to the Authority for consideration.

8.1 FINAL DESIGN CONCEPT RESULTS SUMMARY

Table 8-1 summarizes the recommendations regarding the two design concepts under the Final Design Concept phase based on noise screening and ECWG input. Table 8-1 includes criteria categories to identify the reason(s) why an alternative design concept should not be carried forward to the next steps.

TABLE 8-1 FINAL DESIGN CONCEPT PHASE SUMMARY

ALTERNATIVE DESIGN CONCEPTS	PASS TO NEXT STEPS	ELIMINATE
Modification to COMIX RNAV STAR – Remove Route Between KLOMN and NADDO Waypoints and Keep Jet Arrivals at 6,000 feet MSL at KLOMN		**X (NI)**
RNAV Runway 27 Approach (Version 2) – Extend Approach East and Join Near VYDAA Waypoint (11:00 p.m. to 7:00 a.m.)		**X (NI)**

NOTES:
RNAV – Area Navigation
MSL – Mean Sea Level
STAR – Standard Terminal Arrival Route
Waypoint **–** a predetermined geographical position that is defined in terms of latitude/longitude coordinates. A waypoint is most often used to indicate a change in direction, speed, or altitude along the desired path. RNAV procedures make use of both fly-over and fly-by waypoints.
NI **–** Noise Impact **–** the concept would cause r noise increases for communities based on noise screening results and ECWG member input.
SOURCE: Ricondo & Associates, Inc., September 2019.

8.2 REFINED DESIGN CONCEPT REVIEW

Based on feedback from the ECWG and FAA, refinements to the design concepts passed to the Final Design Concept phase were not necessary. Because there were no changes to the design concepts, a review with the ECWG of the Final Design Concept phase prior to the noise screening analysis was not necessary.

8.3 AIRCRAFT NOISE SCREENING OF FINAL DESIGN CONCEPTS

An aircraft noise screening analysis was conducted to quantify potential decreases and increases in the CNEL as a result of implementing the procedure design concepts identified in the Final Design Concept phase. The methodology was similar to how the FAA conducts noise screening for individual flight procedures. The screening analysis evaluated only jet aircraft associated with the proposed procedures; it did not evaluate all operations to and from SDIA. Therefore, the screening results do not reflect cumulative aircraft noise levels at SDIA, and they should not be used for general noise planning purposes for SDIA. The following subsections summarize the methodology and results for each alternative procedure design concept.

8.3.1 NOISE SCREENING METHODOLOGY

The objective of the aircraft noise screening analysis was to quantify potential decreases and increases in the CNEL if the location of jet aircraft traffic was changed to a different location and/or altitude in accordance with a proposed procedure design concept. The results of the screening analysis do not reflect existing cumulative average annual day (AAD) operations and traffic patterns at SDIA; therefore, they are not intended to reflect total aircraft CNEL noise exposure levels for SDIA. The following subsections describe the baseline and alternative Aviation Environmental Design Tool (AEDT) noise model development methodologies.

8.3.1.1 BASELINE NOISE MODEL DEVELOPMENT METHODOLOGY

The analysis began with the development of a baseline model using the FAA's AEDT that accounts for jet operation and location related to only traffic flows connected to the proposed design concepts. Propeller-driven aircraft were excluded based on the following factors:

- The majority of all propeller-driven aircraft are not assigned or do not fly along an existing published RNAV STAR; therefore, traffic patterns with and without implementing a proposed procedure design concept would not change.
- The largest turbine-propeller aircraft, the Bombardier Q400, operated at SDIA in 2017 with no more than five arrivals and five departures on an average day—the CNEL is below 45 dB for Bombardier Q400 SDIA operations over areas such as East County. This was not a major contributor to total CNEL compared to jet aircraft.

The jet aircraft operations selected were those operating on an existing flight procedure, which was proposed to change to meet the ECWG objectives. **Table 8-2** summarizes the existing traffic flow and flight procedures selected for the baseline screening model and the related Final Design Concept phase alternative.

TABLE 8-2 BASELINE MODEL EXISTING TRAFFIC FLOW

TRAFFIC FLOW	EXISTING PROCEDURE	FINAL DESIGN CONCEPT
Runway 27 jet arrivals from the northwest	COMIX RNAV STAR, HUBRD Conventional STAR, Runway 27 RNP Approach (from KLOMN Waypoint), Runway 27 Localizer Approach, and FAA ATC Radar Vectors from KLOMN Waypoint Area to Final Approach	Modification to COMIX RNAV STAR – Remove Route Between KLOMN and NADDO Waypoints and Keep Jet Arrivals at 6,000 feet MSL at KLOMN, and Runway 27 RNAV Approach (Version 2) – Extend Approach East and Join Near VYDAA Waypoint
Runway 27 jet arrivals from north, east, and south	LUCKI RNAV STAR, BARRET Conventional STAR, Runway 27 RNP Approach (from LYNDI Waypoint), and FAA ATC Radar Vectors from North, East, and South to Final Approach	No changes to existing procedures.

NOTES:
ATC – Air Traffic Control
FAA – Federal Aviation Administration
RNAV – Area Navigation
RNP – Required Navigation Performance
STAR – Standard Terminal Arrival Route
SOURCE: Ricondo & Associates, Inc., November 2019.

The primary source used to develop the baseline noise model flight track and the operations input into AEDT was radar track and operations data between May 2017 and December 2017. This was the same data set used to support the air traffic procedure noise screening analysis for Runway 27 jet departures and COMIX RNAV STAR arrivals. The data were collected from the Authority's ANOMS. The entire 2017 year was not collected because the FAA did not

complete the implementation of the SoCal Metroplex RNAV procedures until April 2017. The intent for the baseline model was to include traffic patterns after the FAA completed implementation. The seven months of radar track and flight plan data were more than adequate to conduct a noise screening assessment, and this exceeds the amount of data typically used by the FAA when conducting screening analyses (typically 10 randomly selected days). In addition, the same data were used for the entire air traffic procedure analysis for consistency purposes.

The arrival and departure radar tracks and associated flight data were reviewed to ensure the accuracy of runway assignments, and radar tracks with unusable geometry were excluded from the analysis. Radar track data not associated with Runway 27 arrivals were excluded from the East County baseline data set. Each radar track was tagged with its propulsion type (jet, turbine-propeller, piston propeller), aircraft weight category (heavy, large, small), and time of day (daytime, 7:00 a.m. to 6:59 p.m.; evening, 7:00 p.m. to 9:59 p.m.; and nighttime, 10:00 p.m. to 6:59 a.m.).

Following the data cleanup and tagging stage, the geometries of the radar track arrivals from the northwest to Runway 27 were reviewed to group flights with similar flight paths into the same corridors (e.g., aircraft following the same arrival procedure). The grouping process was sensitive to flight path dispersion (RNAV or conventional dispersion) and time of day (daytime/evening hours or nighttime hours). The groups of radar tracks are referred to as bundles. Arrivals from the south, east, and north were also bundled, but not at the level of detail conducted for northwest jet arrivals.

AEDT noise model flight tracks were created for each individual bundle of radar tracks. The noise model flight tracks represent the radar track bundles with a system of primary flight noise model tracks, or "backbone" tracks, and additional "dispersed" noise model tracks. The combination of backbone and dispersed tracks serve as representative AEDT noise model flight tracks for a given bundle. The backbone noise model track lies at the center of a bundle, with one or more dispersed noise model tracks on each side. The locations of the backbone and dispersed tracks were based on the track density of a unique bundle. Geographic spatial analysis tools were employed to identify the average or center of a bundle (the backbone) at multiple increments along the bundle. The analysis also identified points left and right of the average according to the radar track distribution within a unique bundle. The left and right points were used to develop the dispersed noise model tracks.

The altitude for each bundle was also evaluated to determine the need to customize the altitude profile to better reflect actual AAD altitude along a specific traffic flow. Runway 27 jet arrivals from the northwest did occur at or below 6,000 feet AFE within the evaluation area as traffic crosses the San Diego State University area where the KLOMN waypoint is located. In addition, the proposed design concept for Runway 27 arrivals from the northwest specifies altitude requirements at the KLOMN and NADDO waypoints. Therefore, altitude profiles were customized for the arrivals using altitude controls at the KLOMN and NADDO waypoints, as defined by the existing RNAV arrival procedure (e.g., COMIX RNAV STAR) or the calculated average altitudes of a bundle (for conventional procedures and FAA ATC radar vectored traffic). Jet arrivals that turn south after or near the KLOMN waypoint to join the final approach were assigned 5,000 feet AFE at the waypoint. Jet arrivals that operate between the KLOMN and NADDO waypoints and turn south at or near the NADDO waypoint to join the final approach cross near the KLOMN waypoint area at 5,500 feet AFE and 5,000 feet AFE near the NADDO waypoint area. Jet arrivals that operate between the KLOMN and NADDO waypoints and were turned east after NADDO were assigned 6,000 feet AFE near the KLOMN waypoint area and 5,500 feet AFE near the NADDO waypoint area. All other jet arrivals that proceed east after the KLOMN waypoint area thence proceed east before turning south to join the final approach were assigned 6,000 feet AFE at or near the KLOMN waypoint area. The AEDT would calculate the altitude and aircraft performance profiles based on the user-defined altitude controls and the standard aircraft procedure profile database provided in AEDT.

The flight information (e.g., aircraft type, number of operations, and origin/destination) from each radar track in a bundle was assigned to the corresponding noise model flight tracks representing the bundle. Flight operation distribution among the backbone and dispersed noise model tracks was based on actual distribution observed radar track density of the bundle of radar tracks. This dispersion more accurately represents each flight corridor by accounting for variability attributable to weather, aircraft type, traffic, pilot technique, and other factors. The count of operations was converted to an AAD level by dividing the count by 244 days (number of days between May 2017 and December 2017). Of the 591 total AAD operations that occurred at SDIA between May 2017 and December 2017, 275 AAD jet arrivals associated with the SDIA arrival traffic flows to Runway 27 identified in Table 8-2 were modeled.[18] The noise model flight tracks and the flight operations database were converted into AEDT format.

The baseline AEDT model included not only the noise model flight tracks and AAD operations, but also the terrain (provided by US Geological Survey [USGS]), the average weather conditions (temperature, humidity, and air pressure) observed at SDIA in 2017, and the uniformed closely spaced grid points. The CNEL was calculated for each uniformed, closely spaced grid. The use of grid points in lieu of noise exposure contours is consistent with the FAA ATO's noise screening methodology. The CNEL was compared to the alternative CNEL at each grid point to determine potential decreases and increases resulting from implementing a proposed design concept alternative.

8.3.1.2 ALTERNATIVE DESIGN CONCEPT NOISE MODEL DEVELOPMENT METHODOLOGY

Development of the AEDT noise model for each alternative design concept started with the baseline noise model input, and modifications were made primarily to the noise model tracks to account for the alternative procedure design. The primary objective was to modify the baseline input to account for relocating flights that are expected to operate on a proposed RNAV procedure design concept. All other variables, such as aircraft type, operation levels, runway use, origin/destination, and FAA ATC vector patterns, would remain the same between the baseline and alternative modeled scenarios. The methodology focused on two elements: (1) modifying noise model track geometry to reflect an alternative design concept; and (2) assigning an appropriate level of operations to the proposed design concept model tracks.

Baseline noise model tracks representing northwest jet arrivals from the KLOMN to NADDO waypoints to Runway 27 were selected to be modified to reflect the proposed change to the COMIX RNAV STAR to end at the KLOMN waypoint instead of the NADDO waypoint. The baseline noise model tracks following the COMIX RNAV STAR flight path between the LNTRN and KLOMN waypoints thence to the NADDO waypoint and vectored at or after the NADDO waypoint to join the final approach to Runway 27 were modified to reflect jet arrivals proceeding east after the KLOMN waypoint. In addition, all operations were assigned 6,000 feet AFE near the KLOMN waypoint area. All jet arrivals from the northwest that operated between the KLOMN and NADDO waypoints were assigned the modified COMIX RNAV STAR noise model tracks. All daytime and evening operations were assigned the modified noise model tracks. In addition, jet arrivals from the northwest between 10:00 p.m. and 10:59 p.m. were assigned to the modified COMIX RNAV STAR noise model tracks.

Because the proposed RNAV approach to Runway 27 does not exist for nighttime (11:00 p.m. to 7:00 a.m.[19]) arrivals from the northwest, a new noise model flight track was developed based on the designed flight path. All jet arrivals

[18] The AAD count was based on the total number of flights recorded in the ANOMS database between May 2017 and December 2017 divided by 244 days.

[19] The hours represent the low demand period for arrivals to Runway 27 from the northwest.

from the northwest that occurred between 11:00 p.m. an 7:00 a.m. were assigned to the proposed Runway 27 RNAV approach.

Baseline noise model tracks representing FAA ATC–managed arrivals from the northwest and all arrivals from the north, east, and south were maintained for the alternative scenario.

The alternative AEDT models included the same terrain (provided by USGS), the average weather conditions (temperature, humidity, and air pressure) observed at SDIA in 2017, and the uniformed, closely spaced grid points used in the baseline AEDT model. The CNEL was calculated for each uniformed, closely spaced grid point. The CNEL was compared to the baseline CNEL at each grid point to determine potential decreases and increases resulting from implementing a proposed design concept alternative.

8.3.1.3 ALTERNATIVE NOISE SCREENING MODEL SCENARIOS

The objective of the noise screening analysis was to quantify potential increases and decreases in CNEL for the design concepts. The method used to achieve the objective was to develop an alternative scenario, Alternative 1, in AEDT that included the design concepts passed to the Final Design Concept phase and existing procedures not subject to change. The design concepts were not mutually exclusive and were combined in Alternative 1 to capture the total CNEL. Alternative 1 CNEL results were compared to the baseline AEDT CNEL results to quantify potential increases and decreases in CNEL. **Table 8-3** lists the design concepts and the existing procedures that comprise Alternative 1 and related assumptions.

TABLE 8-3 ALTERNATIVE 1 NOISE SCREENING MODEL SCENARIOS

PROCEDURES	STATUS	
FAA ATC Radar Vectors/ATC Visual Approach Clearance	Existing Procedure	Maintain current dispersion patterns associated with FAA ATC issued headings or clearing a pilot to conduct a visual approach – expected to occur during high arrival demand
Runway 27 RNP Approach	Existing Procedure	Maintain current RNP approach from KLOMN waypoint – expected to occur for authorized operations (meet navigation equipment requirements and pilot certification)
COMIX RNAV STAR Amendment – Remove Route Between KLOMN and NADDO Waypoints and Keep Jet Arrivals at 6,000 feet MSL at KLOMN	Final Design Concept	Discontinue route between KLOMN and NADDO waypoints. Keep aircraft at or above 6,000 feet MSL at the KLOMN waypoint thence direct aircraft east while descending until FAA ATC directs pilot to turn south to join final approach – expected to occur unless demand levels require FAA ATC vectors
Runway 27 RNAV Approach (Version 2) – Extend Approach East and Join Near VYDAA Waypoint (11:00 p.m. to 7:00 a.m.)	Final Design Concept	Keep aircraft at or above 6,000 feet MSL at the KLOMN waypoint and extend jet arrivals from the northwest further east to turn south over less populated area – expected to occur between 11:00 p.m. and 7:00 a.m.

NOTES:
ATC – Air Traffic Control
FAA – Federal Aviation Administration
MSL – Mean Sea Level
RNP – Required Navigation Performance
RNAV – Area Navigation
STAR – Standard Terminal Arrival Route
SOURCE: Ricondo & Associates, Inc., November 2019.

8.3.2 NOISE SCREENING RESULTS

The noise screening results focused on changes in CNEL caused by implementing the proposed final design concepts for Alternative 1. Calculated changes at or above 1 CNEL A-weighted decibel (dBA) for closely spaced grids points located within the focused community areas were identified. For reference, most people begin to detect a change in noise when levels increase or decrease by 3 dBA. Some individuals are more sensitive to noise; therefore, changes at or above 1 dBA were identified.

Exhibit 8-1 depicts the baseline and Alternative 1 noise model tracks related to the calculated changes equal to or higher than 1 CNEL dBA indicated on the exhibit. The noise model tracks depicted on Exhibit 8-1 indicate expected flight paths under Alternative 1 (magenta and pink noise model tracks) compared to the baseline noise model tracks that modeled flights between the KLOMN and NADDO waypoints (orange noise model tracks). For clarity purposes, the noise model tracks representing FAA ATC–managed procedures from the north, east, and south and the Runway 27 RNP approach were not depicted on Exhibit 8-1, but they were included in the model input to calculate the CNEL at each grid point. **Exhibit 8-2** depicts the change in the CNEL without the noise model tracks for clarity purposes.

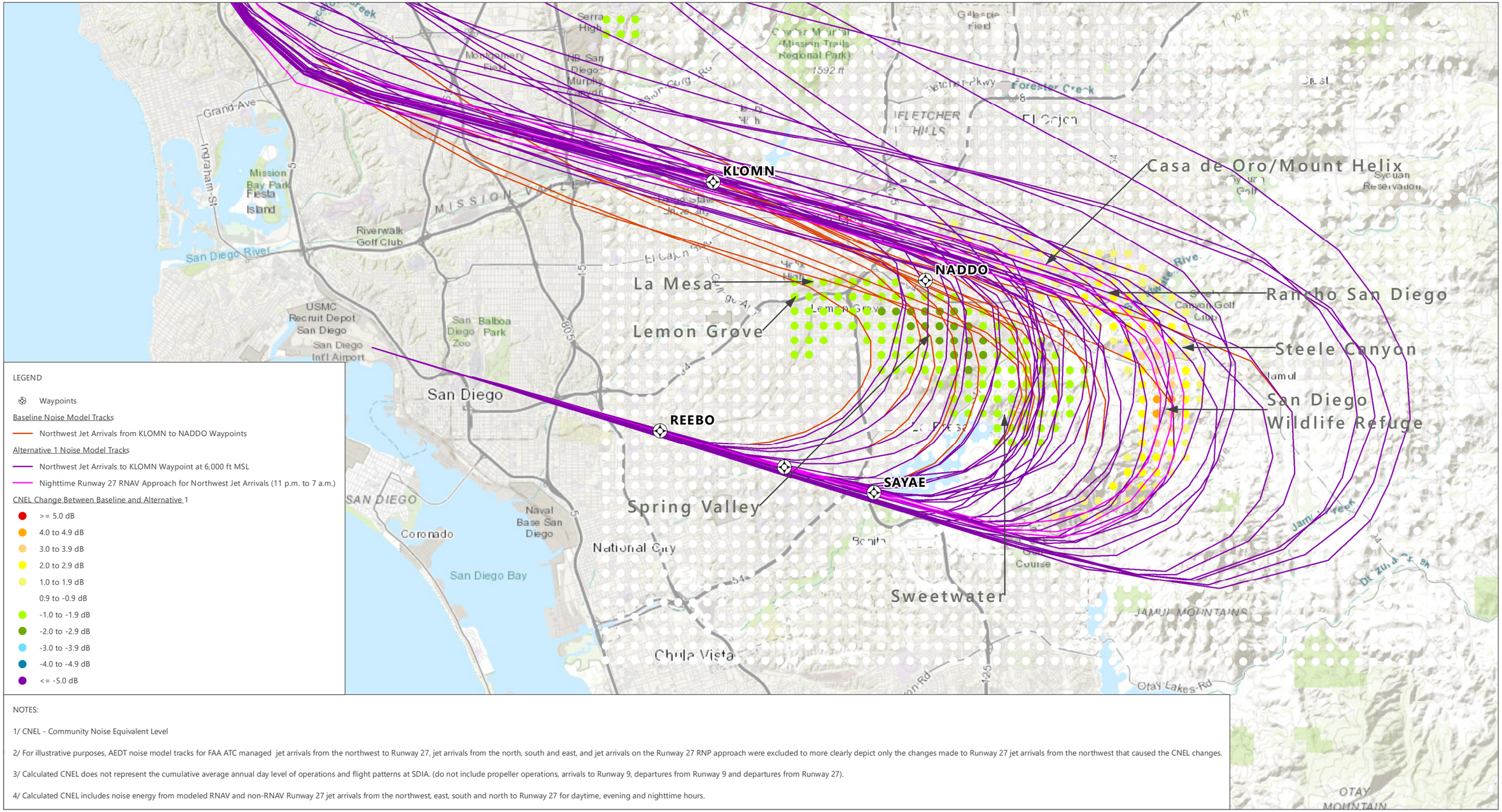
The results indicated the CNEL within East County may exhibit the following changes:

- decreases between 1 and 2 CNEL dBA for the Lemon Grove, La Mesa, Sweetwater, and Spring Valley community areas
- decreases between 2 and 3 CNEL dBA for the Spring Valley area
- increases between 1 and 2 CNEL dBA for the Casa de Oro and Mount Helix community areas
- increases between 2 and 3 CNEL dBA for the Rancho San Diego community areas
- increases between 3 and 4 CNEL dBA for the Steele Canyon community area
- increases between 4 and 5 CNEL dBA for the San Diego Wildlife Refuge area

The cause for the change was attributed to two factors:

1. All jet arrivals from the northwest between 11:00 p.m. and 7:00 a.m. that were dispersed over East County would now follow the proposed Runway 27 RNAV approach path, which would cause an increase in the CNEL over communities such as Casa de Oro, Mount Helix, Rancho San Diego, and Steel Canyon and a decrease in the CNEL for communities such as Spring Valley and Sweetwater.
2. All jet arrivals from the northwest that followed the KLOMN to NADDO path would now proceed east after passing KLOMN, which would cause a decrease in the CNEL for communities such as Lemon Grove, La Mesa, and Spring Valley and an increase in the CNEL for communities such as Casa de Oro and Mount Helix.

The higher CNEL increases over areas such as Steele Canyon are caused primarily by implementing the proposed Runway 27 RNAV approach for all nighttime jet arrivals. A second alternative was modeled to identify potential changes in the CNEL if the Runway 27 RNAV approach was excluded. **Table 8-4** lists the design concepts and existing procedures that comprise Alternative 2 and related assumptions.



LEGEND

- Waypoints

Baseline Noise Model Tracks

- Northwest Jet Arrivals from KLOMN to NADDO Waypoints

Alternative 1 Noise Model Tracks

- Northwest Jet Arrivals to KLOMN Waypoint at 6,000 ft MSL
- Nighttime Runway 27 RNAV Approach for Northwest Jet Arrivals (11 p.m. to 7 a.m.)

CNEL Change Between Baseline and Alternative 1

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

NOTES:

1/ CNEL - Community Noise Equivalent Level

2/ For illustrative purposes, AEDT noise model tracks for FAA ATC managed jet arrivals from the northwest to Runway 27, jet arrivals from the north, south and east, and jet arrivals on the Runway 27 RNP approach were excluded to more clearly depict only the changes made to Runway 27 jet arrivals from the northwest that caused the CNEL changes.

3/ Calculated CNEL does not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and departures from Runway 27).

4/ Calculated CNEL includes noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

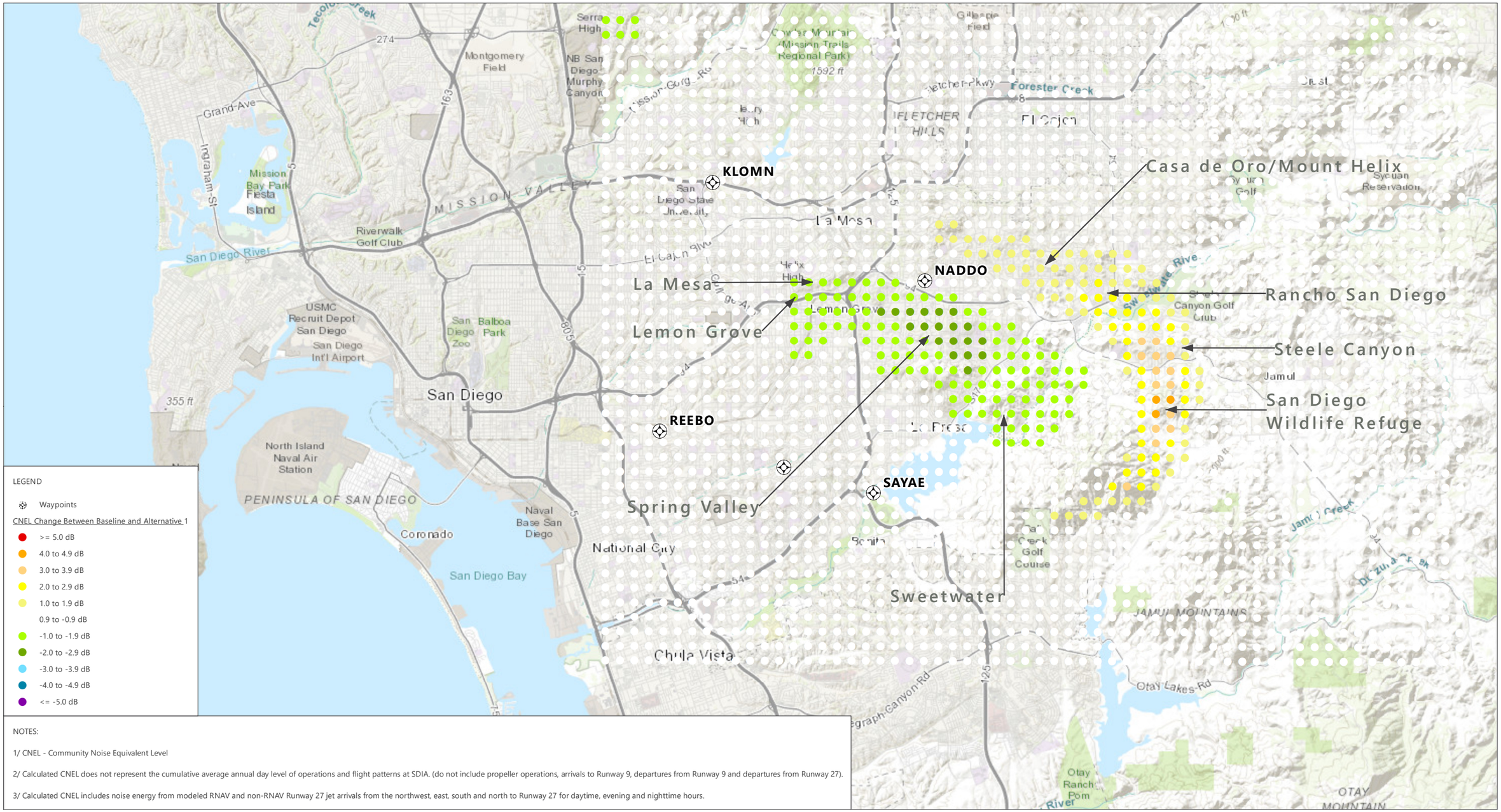
SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, December 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL results; alternative noise model tracks; average annual day operations and baseline noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

NORTH 0 12,000 ft

EXHIBIT 8-1

ALTERNATIVE 1 AND BASELINE NOISE MODEL TRACKS
WITH COMMUNITY NOISE EQUIVALENT LEVEL CHANGES

P:\GIS\Projects\SAN\MXD\SAN_Exhibit8-1_Alt1Baseline_CNELChanges_20200113.mxd



NOTES:

1/ CNEL - Community Noise Equivalent Level

2/ Calculated CNEL does not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and departures from Runway 27).

3/ Calculated CNEL includes noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, December 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL results; alternative noise model tracks; average annual day operations and baseline noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

NORTH 0 12,000 ft

EXHIBIT 8-2

CHANGES IN COMMUNITY NOISE EQUIVALENT LEVEL – ALTERNATIVE 1 COMPARED TO BASELINE

P:\GIS\Projects\SAN\MXD\SAN_Exhibit8-2_ChangesInCNEL_Alt1ComparedToBaseline_20200113.mxd

TABLE 8-4 ALTERNATIVE 2 NOISE SCREENING MODEL SCENARIOS

PROCEDURES	STATUS	
FAA ATC Radar Vectors/ATC Visual Approach Clearance	Existing Procedure	Maintain current dispersion patterns associated with FAA ATC issued headings or clearing a pilot to conduct a visual approach – expected to occur during high arrival demand
Runway 27 RNP Approach	Existing Procedure	Maintain current RNP approach from KLOMN waypoint – expected to occur for authorized operations (meet navigation equipment requirements and pilot certification)
COMIX RNAV STAR Amendment – Remove Route Between KLOMN and NADDO Waypoints and Keep Jet Arrivals at 6,000 feet MSL at KLOMN	Final Design Concept	Discontinue route between KLOMN and NADDO waypoints. Keep aircraft at or above 6,000 feet MSL at the KLOMN waypoint thence direct aircraft east while descending until FAA ATC directs pilot to turn south to join final approach – expected to occur unless demand levels require FAA ATC vectors

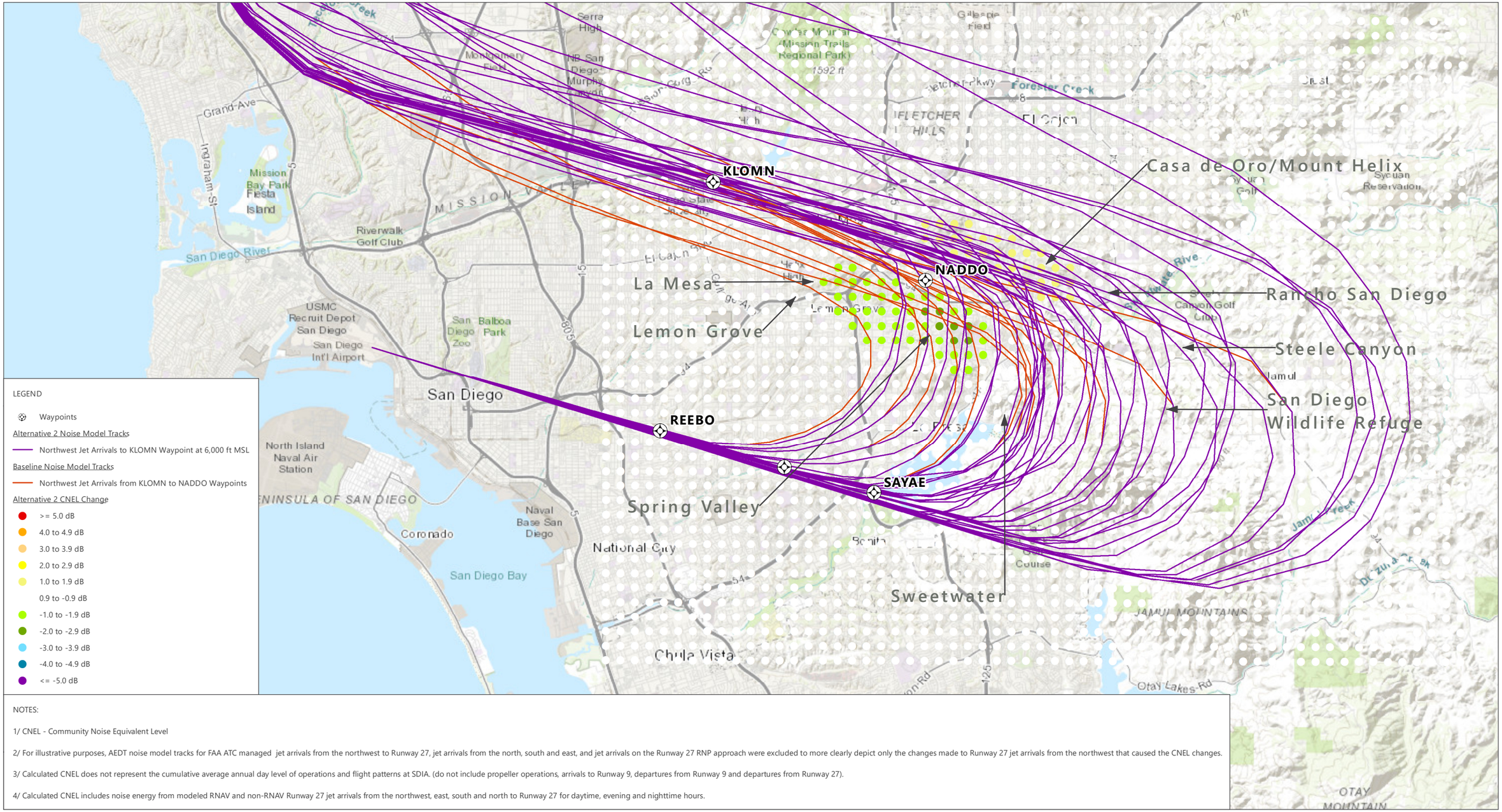
NOTES:
ATC – Air Traffic Control
FAA – Federal Aviation Administration
MSL – Mean Sea Level
RNP – Required Navigation Performance
RNAV – Area Navigation
STAR – Standard Terminal Arrival Route
SOURCE: Ricondo & Associates, Inc., November 2019.

Exhibit 8-3 depicts the baseline and Alternative 2 noise model tracks related to the calculated changes equal to or higher than 1 CNEL dBA indicated on the exhibit. The noise model tracks depicted on Exhibit 8-3 indicate expected flight paths under Alternative 2 (magenta noise model tracks) compared to the baseline noise model tracks that modeled flights between the KLOMN and NADDO waypoints (orange noise model tracks). For clarity purposes, the noise model tracks representing FAA ATC–managed procedures from the north, east, and south and the Runway 27 RNP approach were not depicted on Exhibit 8-3, but they were included in the model input to calculate the CNEL at each grid point. **Exhibit 8-4** depicts the change in the CNEL without the noise model tracks for clarity purposes.

The results indicated the CNEL within East County may exhibit the following changes:

- decreases between 1 and 2 CNEL dBA for the Lemon Grove, La Mesa, and Spring Valley community areas
- decreases between 2 and 3 CNEL dBA for the Spring Valley area
- increases between 1 and 2 CNEL dBA for the Casa de Oro, Mount Helix, and Rancho San Diego community areas

The increases in the CNEL for areas such as Casa de Oro and Mount Helix were caused by directing all jet arrivals east after passing the KLOMN waypoint, which caused the decreases in CNEL for the Lemon Grove, La Mesa, and Spring Valley community areas.



NOTES:

1/ CNEL - Community Noise Equivalent Level

2/ For illustrative purposes, AEDT noise model tracks for FAA ATC managed jet arrivals from the northwest to Runway 27, jet arrivals from the north, south and east, and jet arrivals on the Runway 27 RNP approach were excluded to more clearly depict only the changes made to Runway 27 jet arrivals from the northwest that caused the CNEL changes.

3/ Calculated CNEL does not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and departures from Runway 27).

4/ Calculated CNEL includes noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

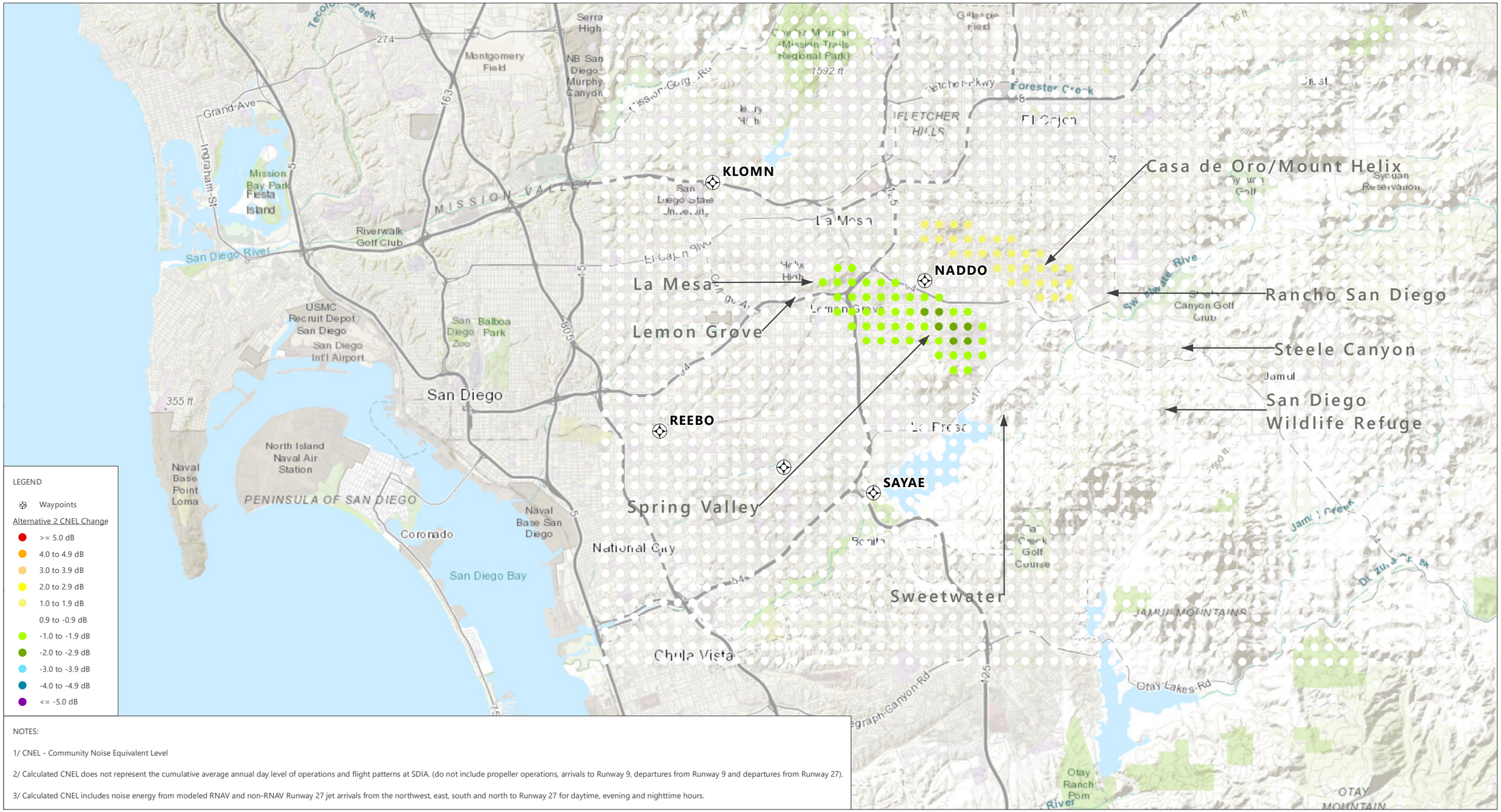
SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, December 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL results; alternative noise model tracks; average annual day operations and baseline noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

NORTH 0 12,000 ft

EXHIBIT 8-3

ALTERNATIVE 2 AND BASELINE NOISE MODEL TRACKS
WITH COMMUNITY NOISE EQUIVALENT LEVEL CHANGES

P:\GIS\Projects\SAN\MXD\SAN_Exhibit8-3_Alt2Baseline_CNELChanges_20200113.mxd



NOTES:

1/ CNEL - Community Noise Equivalent Level

2/ Calculated CNEL does not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and departures from Runway 27).

3/ Calculated CNEL includes noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, December 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL results; alternative noise model tracks; average annual day operations and baseline noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

NORTH 0 12,000 ft

EXHIBIT 8-4

CHANGES IN COMMUNITY NOISE EQUIVALENT LEVEL – ALTERNATIVE 2 COMPARED TO BASELINE

P:\GIS\Projects\SAN\MXD\SAN_Exhibit8-4_ChangesInCNEL_Alt2ComparedToBaseline_20200113.mxd

8.4 FINAL DESIGN CONCEPT REVIEW AND INPUT

The noise screening analysis results and initial recommendations were presented to the ECWG on December 11, 2019 (ECWG Meeting #5). Appendix A includes a copy of the presentation. Ricondo presented the noise screening methodology and results as described in Section 8.3. Ricondo also recommended not to proceed forward with Alternative 1 due to the reportable increases in the CNEL over communities such as Steele Canyon. ECWG members inquired about possible adjustments to mitigate the increase, but they were advised that the concentration of nighttime jet arrivals would most likely cause an increase for areas where the route would be located. The ECWG agreed with not proceeding forward with Alternative 1 due to the increase in the CNEL.

Ricondo also recommended not to proceed forward with Alternative 2 due to the increase in the CNEL for the Rancho de Oro, Mount Helix, and Rancho San Diego community areas, but the consultant requested ECWG members to consider if the level of increase should prevent the alternative from proceeding forward for further consideration. Ricondo advised the ECWG of the project's parameter to not increase noise for other communities as a result of reducing noise for another community. Based on input from each member, the ECWG concurred with Ricondo's recommendation not to proceed forward with Alternative 2.

The ECWG indicated disappointment in the findings, which resulted in no proposed flight procedure modifications to reduce noise over East County. Ricondo presented a recommendation to the ECWG to encourage the FAA SCT TRACON to keep aircraft on the COMIX RNAV STAR as designed as much as possible. The COMIX RNAV STAR keeps aircraft at 6,000 feet MSL at the KLOMN waypoint, and encouraging the increased use of the procedure would increase the frequency of aircraft at higher altitudes compared to existing conditions. Ricondo emphasized the use of the COMIX RNAV STAR as a requirement is not feasible as FAA ATC needs to redirect traffic to maintain safety and to balance efficiency, but collaborating with FAA SCT TRACON to encourage the use of COMIX RNAV STAR as defined may lead to some noise relief. The ECWG and Authority staff discussed ideas on how encouragement would be implemented. The Authority will coordinate with the ECWG to further define the process.

9. FINAL RECOMMENDATIONS

Based on the technical analysis and input from the ECWG, Ricondo recommended not to proceed with the following Final Design Concept procedures:

- COMIX RNAV STAR Modification – End at KLOMN Waypoint at 6,000 feet MSL
- Nighttime Runway 27 RNAV Approach – Northwest Jet Arrivals Between 11:00 p.m. and 7:00 a.m.

Ricondo advised the ECWG and the Authority to consider moving forward with a program designed to encourage FAA SCT TRACON to keep aircraft on the COMIX RNAV STAR as much as possible. This would keep aircraft at higher altitudes more frequently compared to existing conditions. Ricondo also advised collaborating with FAA SCT TRACON to ensure the STAR for jet arrivals from the northwest keeps aircraft near the KLOMN waypoint at 6,000 feet MSL as the FAA considers Class B airspace changes.

The final recommendations were presented to ANAC on February 19, 2020. A copy of the presentation is provided in Appendix A. Ricondo presented the traffic procedure evaluation process, a description of the final design concepts, the aircraft noise screening results for each final design concept, and recommendations. Ricondo requested ANAC to consider the following actions:

- Proceed forward encouraging FAA SCT TRACON to keep aircraft at 6,000 feet Mean Sea Level at and near the KLOMN waypoint as defined in the COMIX RNAV STAR.

ANAC considered the actions and concurred with Ricondo's recommendations.

APPENDIX A EAST COUNTY WORKING GROUP MEETING PRESENTATIONS

The following are the presentation material discussed at each East County Working Group (ECWG) meeting. This appendix also includes the presentation to the Airport Noise Advisory Committee (ANAC) on February 19, 2020. The presentation included an overview of the results and recommended actions for consideration by ANAC. All presentation material was posted to the San Diego County Regional Airport Authority's (the Authority) website after each meeting.

RICONDO®

San Diego International Airport
East County Working Group - Aircraft Noise Concerns

Meeting #1

PRESENTED TO:
SDIA East County Working Group

PRESENTED BY:
Stephen C. Smith

PRESENTED ON:
December 6, 2018

Agenda

- Introductions
- Meeting Objective
- East County Working Group
- Overview of Air Traffic Evaluation
  - Air Traffic Evaluation Objective
  - Air Traffic Evaluation Process Overview
  - FAA Process Overview
- Understanding East County Concerns related to Aircraft Noise and Overflights
  - Historic and existing SDIA arrival traffic patterns over East County
  - Existing published flight procedures
  - Future air traffic environment changes
  - Workgroup concerns
- Next Steps

Introductions

- East County Working Group Facilitator
  - Ms. Heidi Gantwerk
- San Diego County Regional Airport Authority (Airport Authority)
  - Owns and operates the airport
  - Main Contact: Ms. Sjohnna Knack, Program Manager
- Flight Procedure Analysis Consultant Team
  - Project Lead: Mr. Stephen Smith
  - Ricondo & Associates, Inc.
- East County Working Group Members

Meeting Objective

- Understand role of the East County Working Group
- Confirm intent and expectations of the Air Traffic Evaluation effort
- Educate members on overall SDIA arrival traffic patterns
- Discover overall noise concerns/issues from working group

East County Working Group

East County Working Group

- Purpose:
  - Inform Authority of SDIA aircraft noise concern/issues for East County
  - Provide input to Authority on potential noise abatement recommendations
- Members selected to allow for fair representation of East County communities

Member Responsibilities

- Attend every meeting.
- Come to meeting with an open mind.
- Represent your community in a professional and respectful manner.
- Respect other committee members views and opinions.
- Ask questions as a means to reach a better understanding on a topic.
- Provide meaningful input.

Meeting Conduct and Logistics

- Operated on a consensus basis
- Conducted in a professional and respectful manner
- Facilitated by an experienced meeting facilitator
  - Stay on agenda
  - Be sensitive to meeting time
  - Let every committee member share their thoughts
- Meetings will be open to the public to observe
- Statements to the press can only represent the individual not the committee

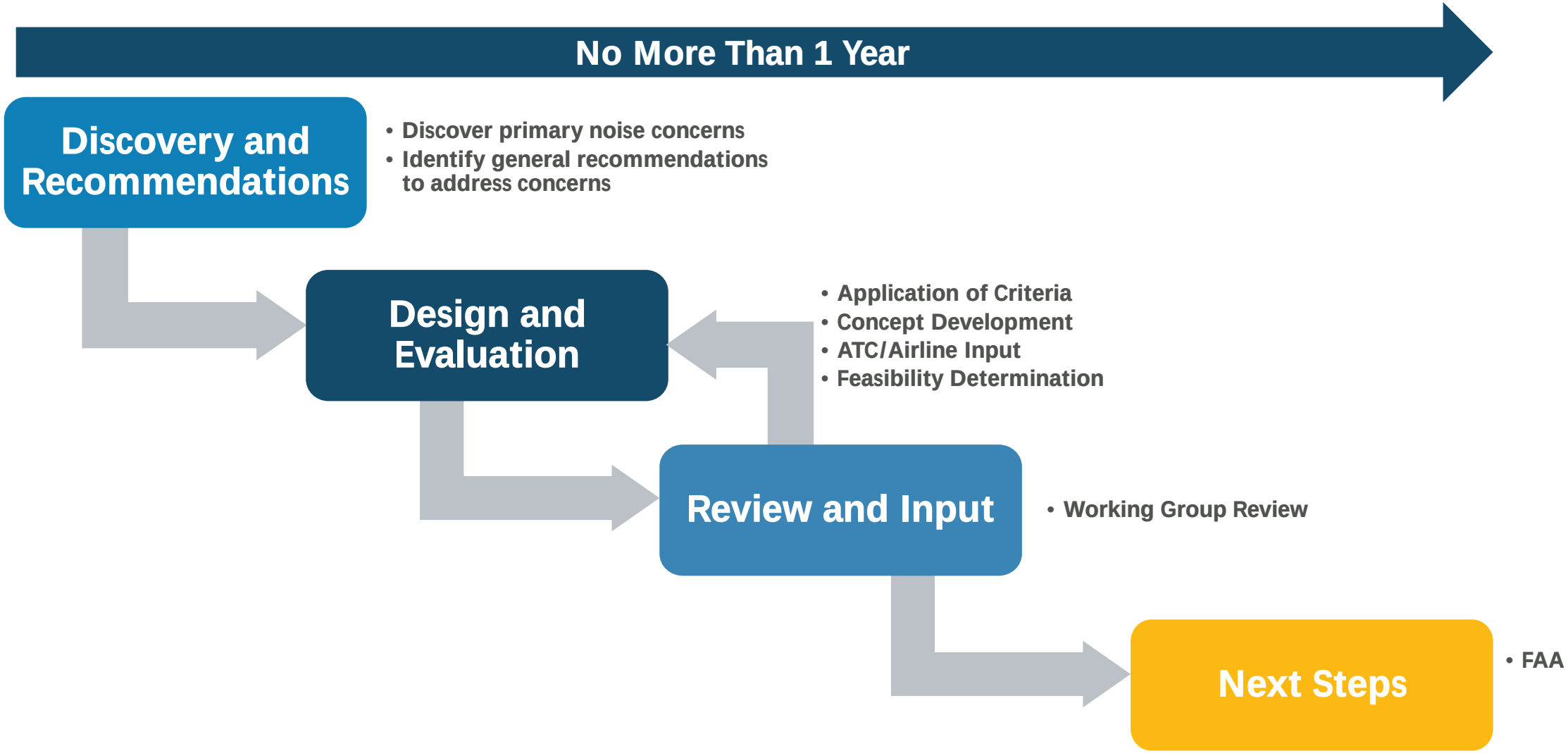
Overview of Air Traffic Evaluation:

Process Overview

East County Air Traffic Evaluation Objective

- Discover and identify SDIA aircraft noise concerns/issues in East County
- Identify air traffic related concepts to address concerns/issues
- Design potential procedure designs to meet the intent
- Determine feasibility of potential procedure designs

East County Air Traffic Evaluation Process Overview



Design and Evaluation Parameters

- Design Parameters
  - Do not change aircraft flight paths at or below 3,000 feet above SDIA's elevation
  - Do not impact safety
  - Meet FAA design criteria
  - Fit within existing airspace
  - Do not impact capacity of SDIA
  - Do not move noise to new non-compatible areas
- Operations Data and Design Tool
  - Evaluate post-November 2016 operations
  - Use FAA's Terminal Area Route Generation, Evaluation and Traffic Simulation (TARGETS) design tool to design concept procedures.

Important Factors

- Will:
  - Propose designs compatible with existing air traffic environment
  - Gather critical input from East County Working Group during design process
  - Coordinate with FAA ATO staff during concept design process
- Will not:
  - Propose designs that require FAA waivers
  - Propose designs that will negatively impact SDIA capacity
  - Conduct all steps in FAA Order 7100.41A
  - Evaluate non-SDIA traffic overflights
  - Evaluate “restriction” type proposals that require 14 CFR Part 161 study

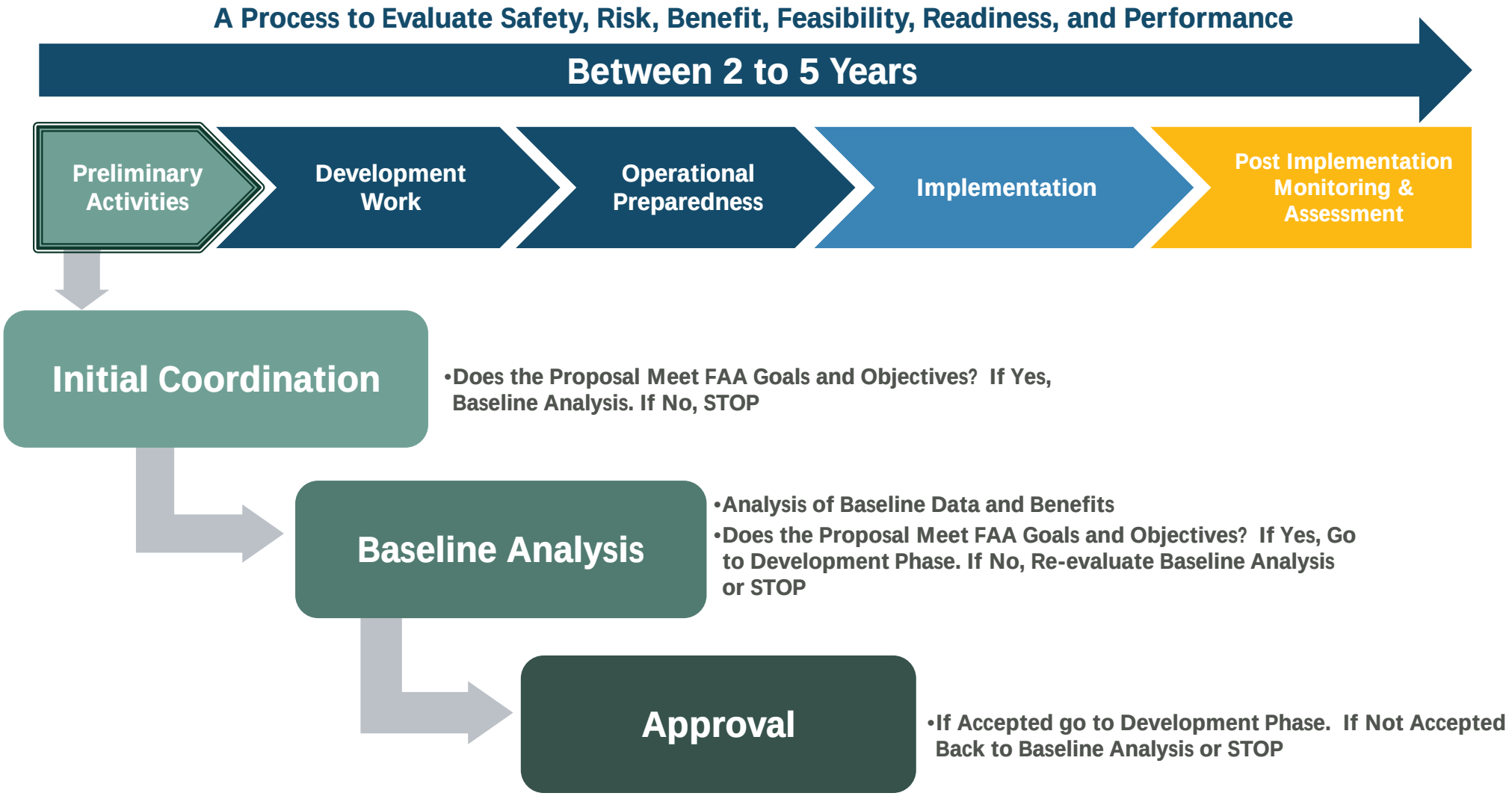
Set Realistic Expectations

- What are we doing here?
  - Understand noise concerns for individual communities and East County as a whole
  - Discover and develop ideas to address noise concerns
  - Determine if the ideas are feasible for both short- and long-term relief
  - Assess overall effect a feasible idea has on the communities within East County
- Will there be aircraft noise relief?
  - Implementation of feasible concepts relies on FAA and airline support
  - Maintain a delicate balance to address all community concerns in East County as a whole and those for individual communities in East County
  - Maintain a delicate balance between airport/air traffic efficiency and noise relief
- How long will it take to get noise relief if found to be feasible?
  - Can take between 2 and 5 years: depends on the proposed concept and environmental review requirements
  - Concepts requiring new technology and airline investment can take even longer than 5 years

Overview of Flight Procedure Analysis:

FAA Process Overview

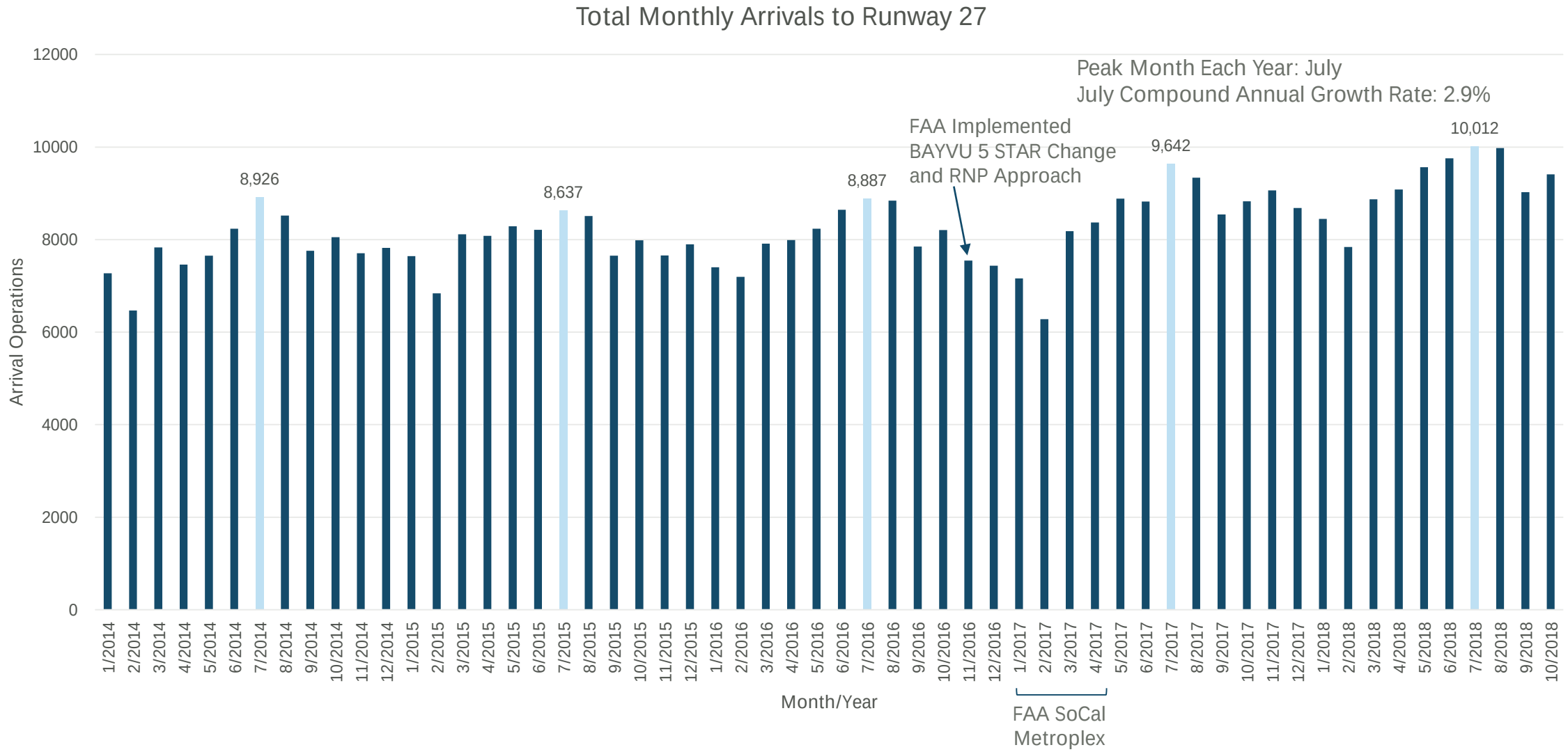
FAA Process and 7100.41 Phase 1 - Preliminary Activities



Understanding East County Concerns related to Aircraft Noise and Overflights

Historic and Existing SDIA Arrival Traffic Patterns over East County

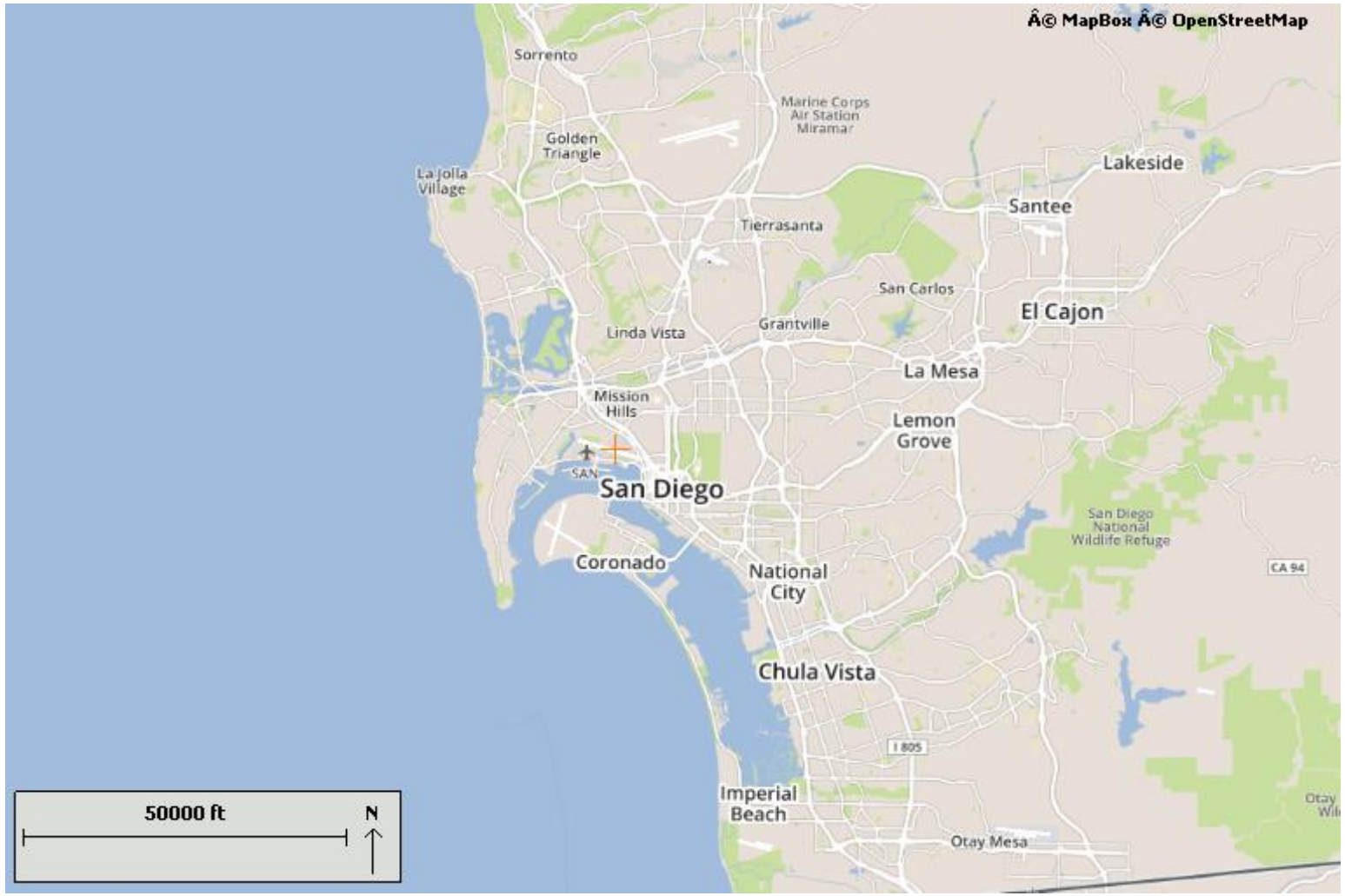
Runway 27 Arrivals – Monthly Operations Since 2014



SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

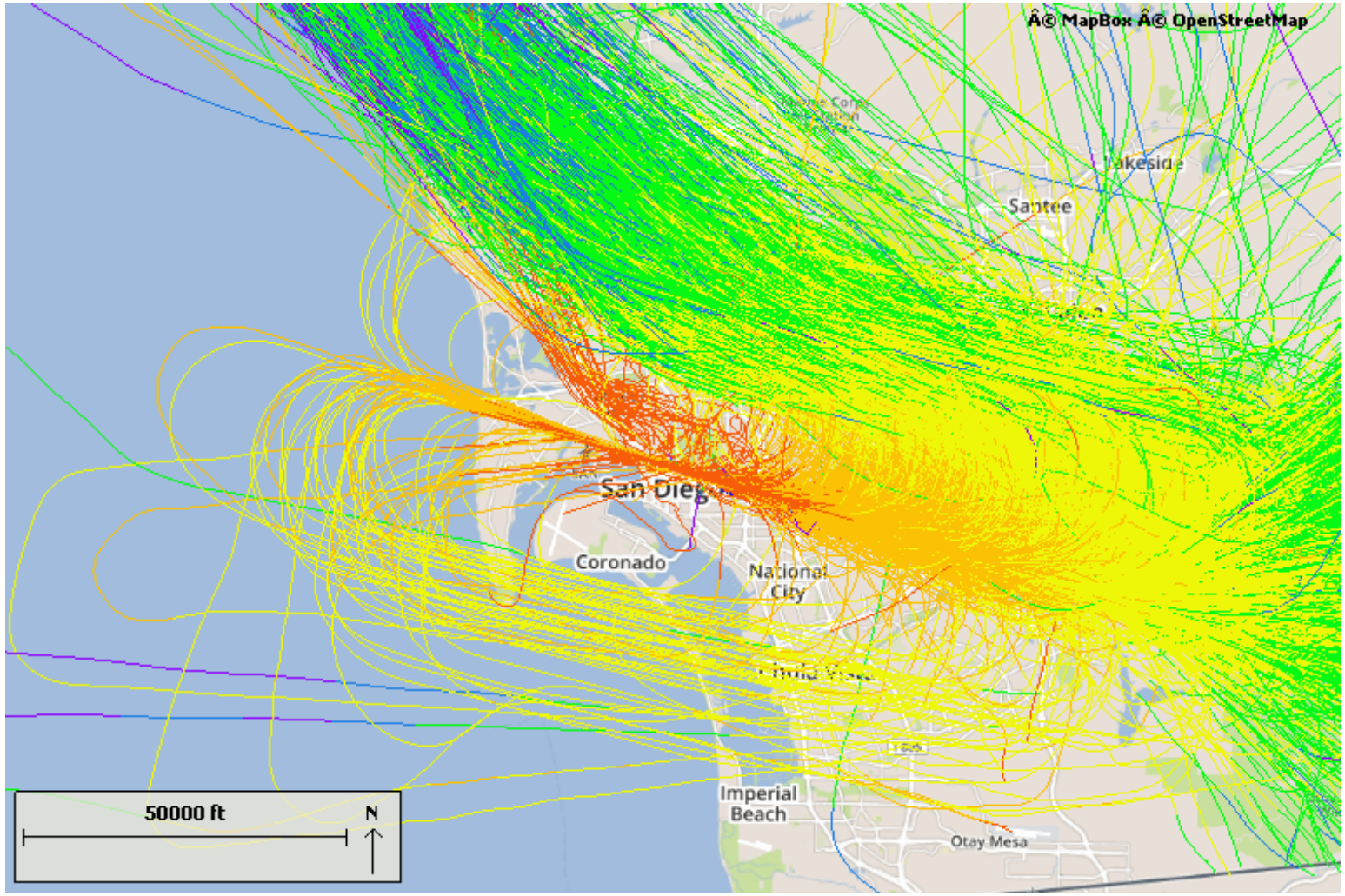
NOTE: Counts include all operations designated as arrivals to Runway 27

Runway 27 Arrivals - Flight Tracks
San Diego Metropolitan Area - July 2014

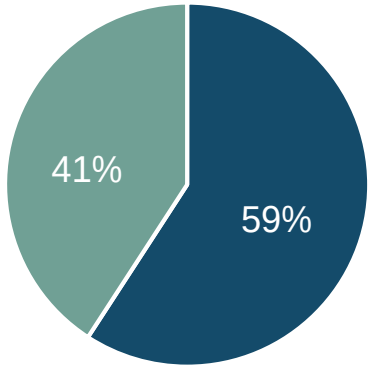


SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Runway 27 Arrivals - Flight Tracks by Altitude
San Diego Metropolitan Area - July 2014



Percentage of Arrivals from North/Northwest and East



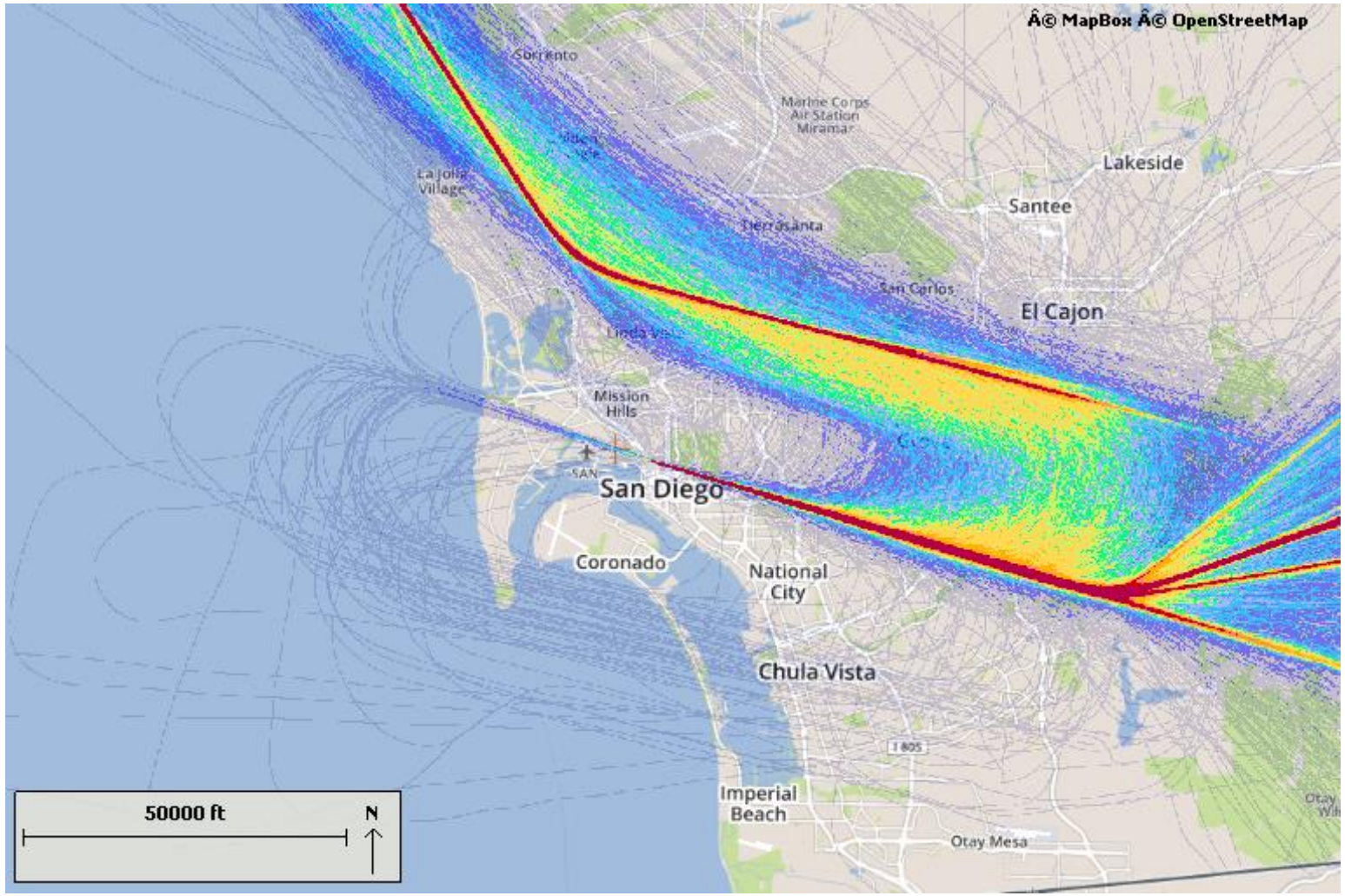
Track Altitude Ranges
(feet above SDIA airfield elevation)

< 2,000
2,000-4,000
4,000-6,000
6,000-8,000
8,000-10,000
> 10,000

SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

NOTES: SDIA airfield elevation is 17 feet MSL; Total Runway 27 arrivals was 8,926 for July 2014

Runway 27 Arrivals - Flight Track Density Analysis
San Diego Metropolitan Area - July 2014



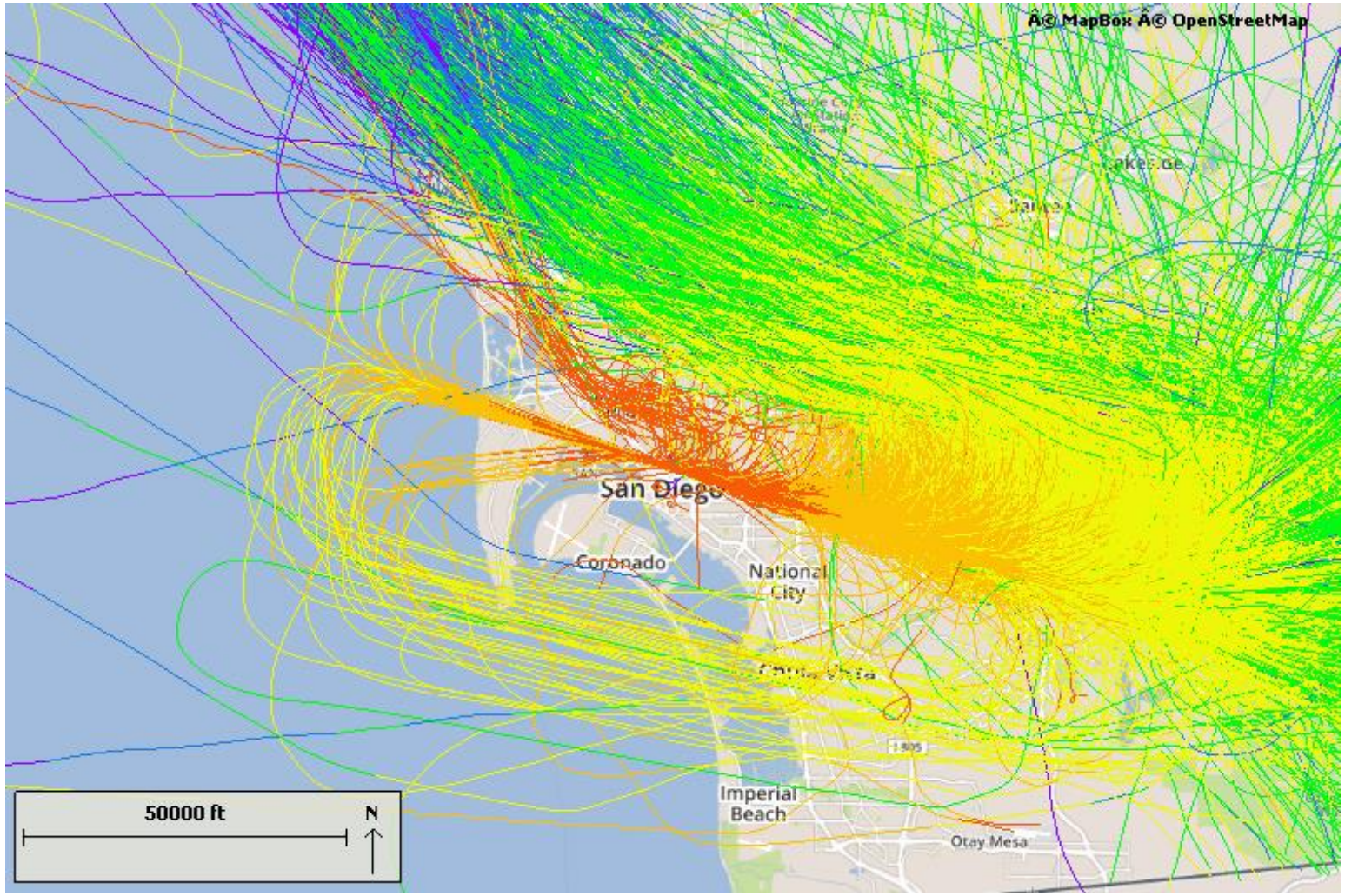
Track Density Ranges
(count of operations)

1	4	< 1 per day
5	9	
10	15	
16	20	
21	25	
26	30	
31	50	1-2 per day
51	75	
76	100	2-5 per day
101	150	
151	13,950	>5 per day

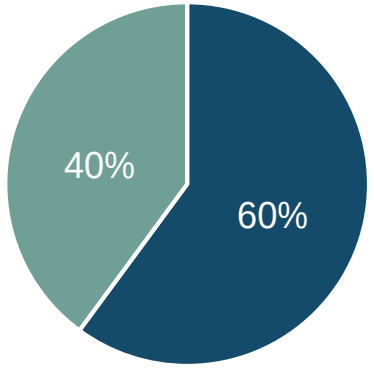
SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Note: Total Runway 27 arrivals was 8,926 for July 2014

Runway 27 Arrivals - Flight Tracks by Altitude
San Diego Metropolitan Area - July 2015



Percentage of Arrivals from North/Northwest and East



East North/Northwest

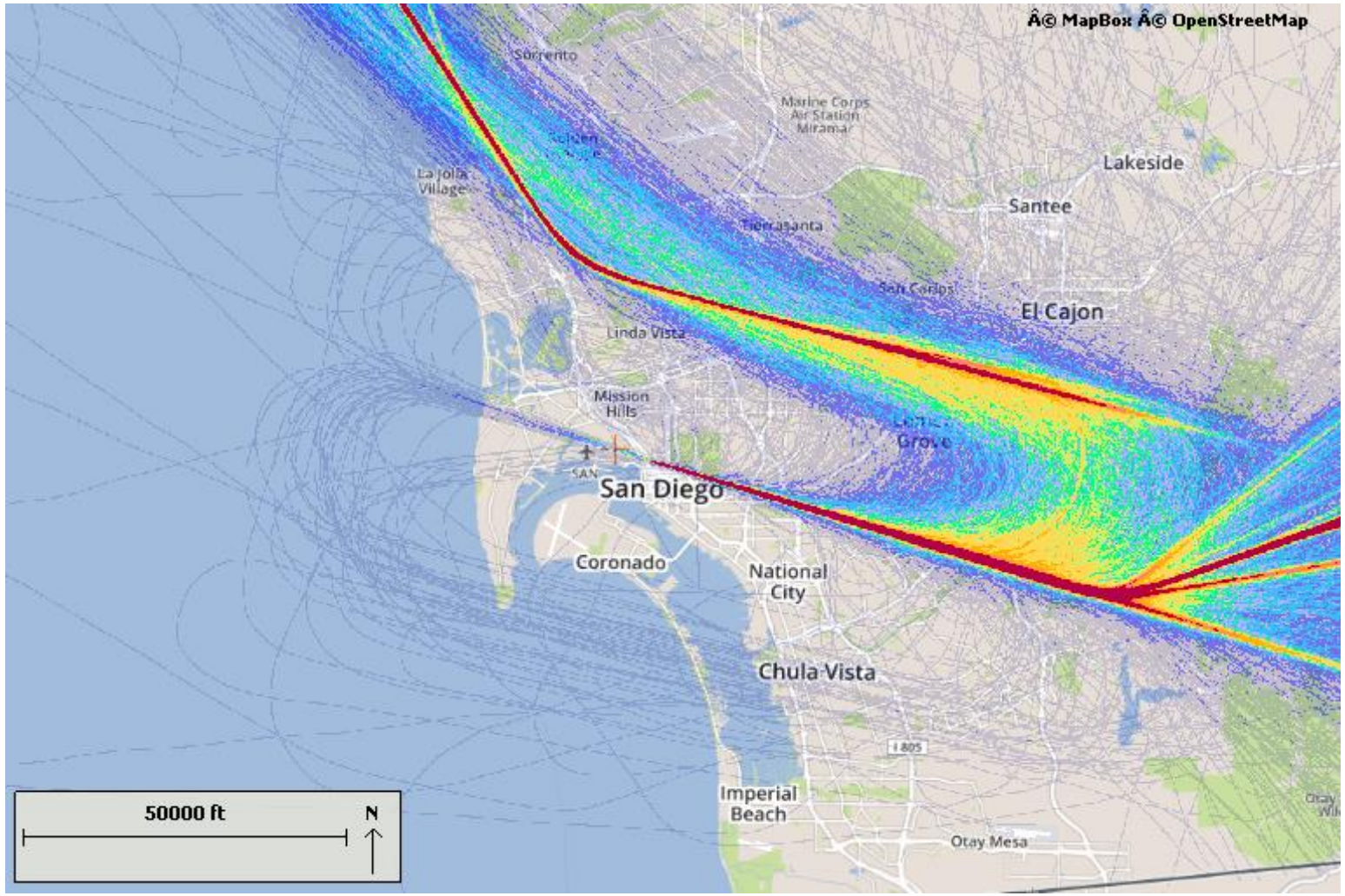
Track Altitude Ranges
(feet above SDIA airfield elevation)

< 2,000	
2,000-4,000	
4,000-6,000	
6,000-8,000	
8,000-10,000	
> 10,000	

SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

NOTES: SDIA airfield elevation is 17 feet MSL; Total Runway 27 arrivals was 8,637 for July 2015

Runway 27 Arrivals - Flight Track Density Analysis
San Diego Metropolitan Area - July 2015



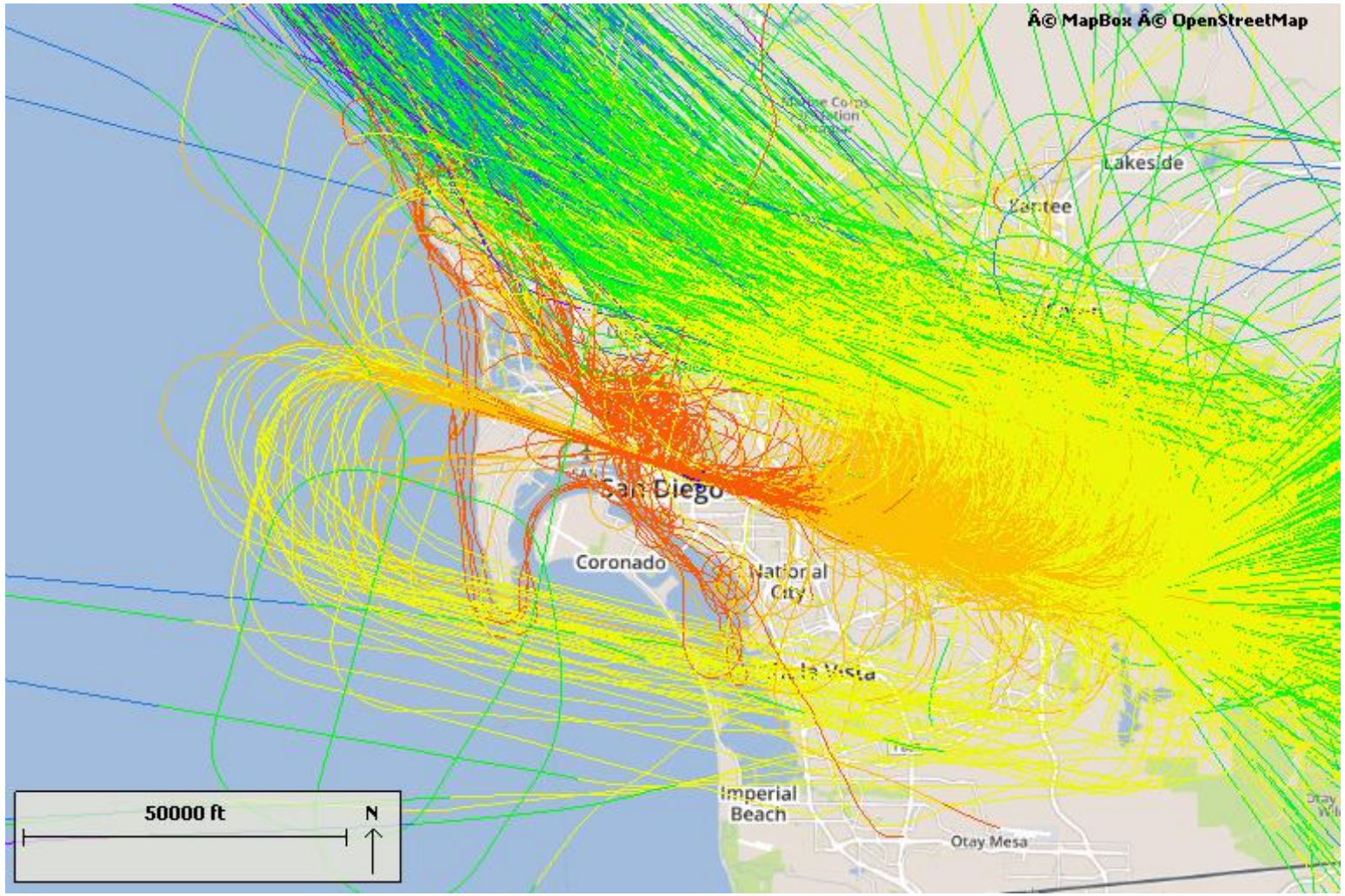
Track Density Ranges
(count of operations)

1	4	< 1 per day
5	9	
10	15	
16	20	
21	25	
26	30	
31	50	1-2 per day
51	75	
76	100	2-5 per day
101	150	
151	13,950	>5 per day

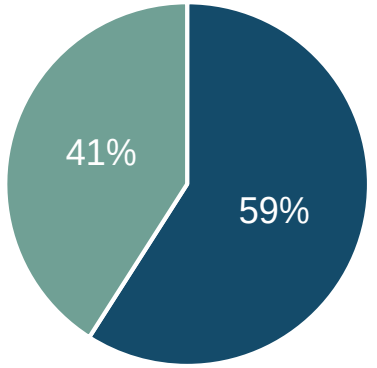
SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Note: Total Runway 27 arrivals was 8,637 for July 2015

Runway 27 Arrivals - Flight Tracks by Altitude
San Diego Metropolitan Area - July 2016



Percentage of Arrivals from North/Northwest and East



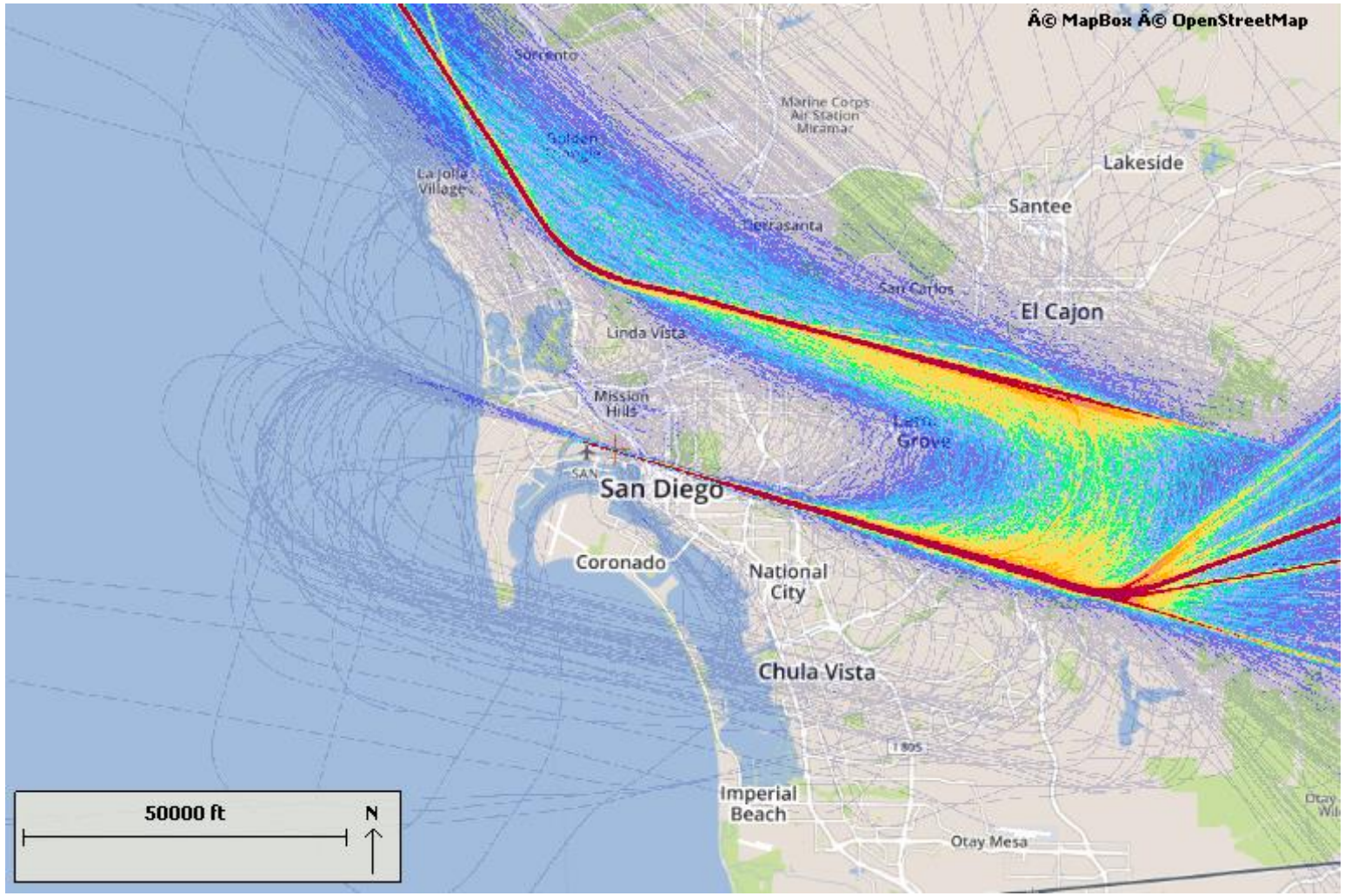
Track Altitude Ranges
(feet above SDIA airfield elevation)

< 2,000
2,000-4,000
4,000-6,000
6,000-8,000
8,000-10,000
> 10,000

SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

NOTES: SDIA airfield elevation is 17 feet MSL; Total Runway 27 arrivals was 8,887 for July 2016

Runway 27 Arrivals - Flight Track Density Analysis
San Diego Metropolitan Area - July 2016



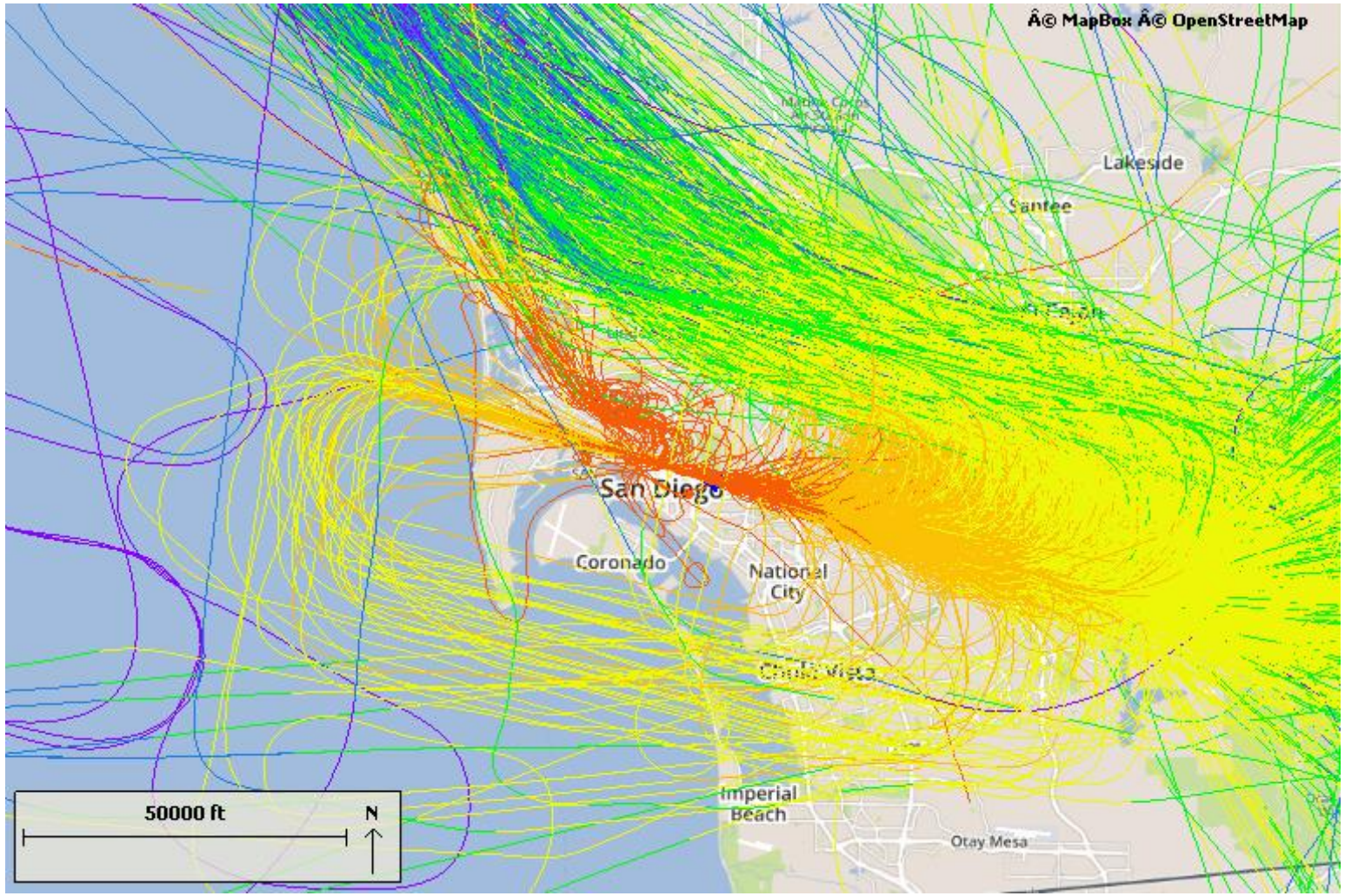
Track Density Ranges
(count of operations)

1	4	< 1 per day
5	9	
10	15	
16	20	
21	25	
26	30	
31	50	1-2 per day
51	75	
76	100	2-5 per day
101	150	
151	13,950	>5 per day

SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Note: Total Runway 27 arrivals was 8,887 for July 2016

Runway 27 Arrivals - Flight Tracks by Altitude
San Diego Metropolitan Area - November 2016



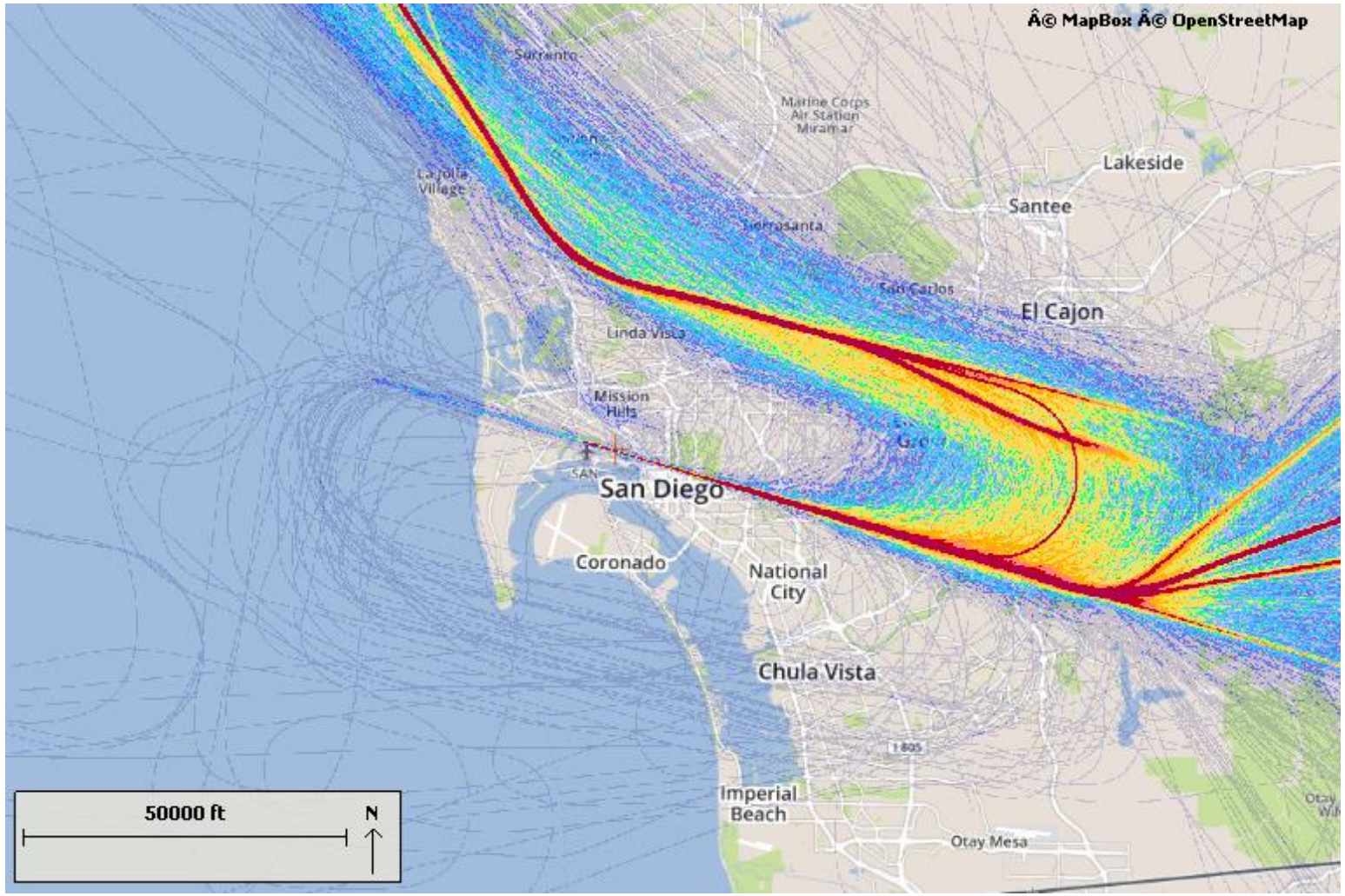
Track Altitude Ranges
(feet above SDIA airfield elevation)

< 2,000	
2,000-4,000	
4,000-6,000	
6,000-8,000	
8,000-10,000	
> 10,000	

SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

NOTES: SDIA airfield elevation is 17 feet MSL; Total Runway 27 arrivals was 7,547 for November 2016

Runway 27 Arrivals - Flight Track Density Analysis
San Diego Metropolitan Area - November 2016



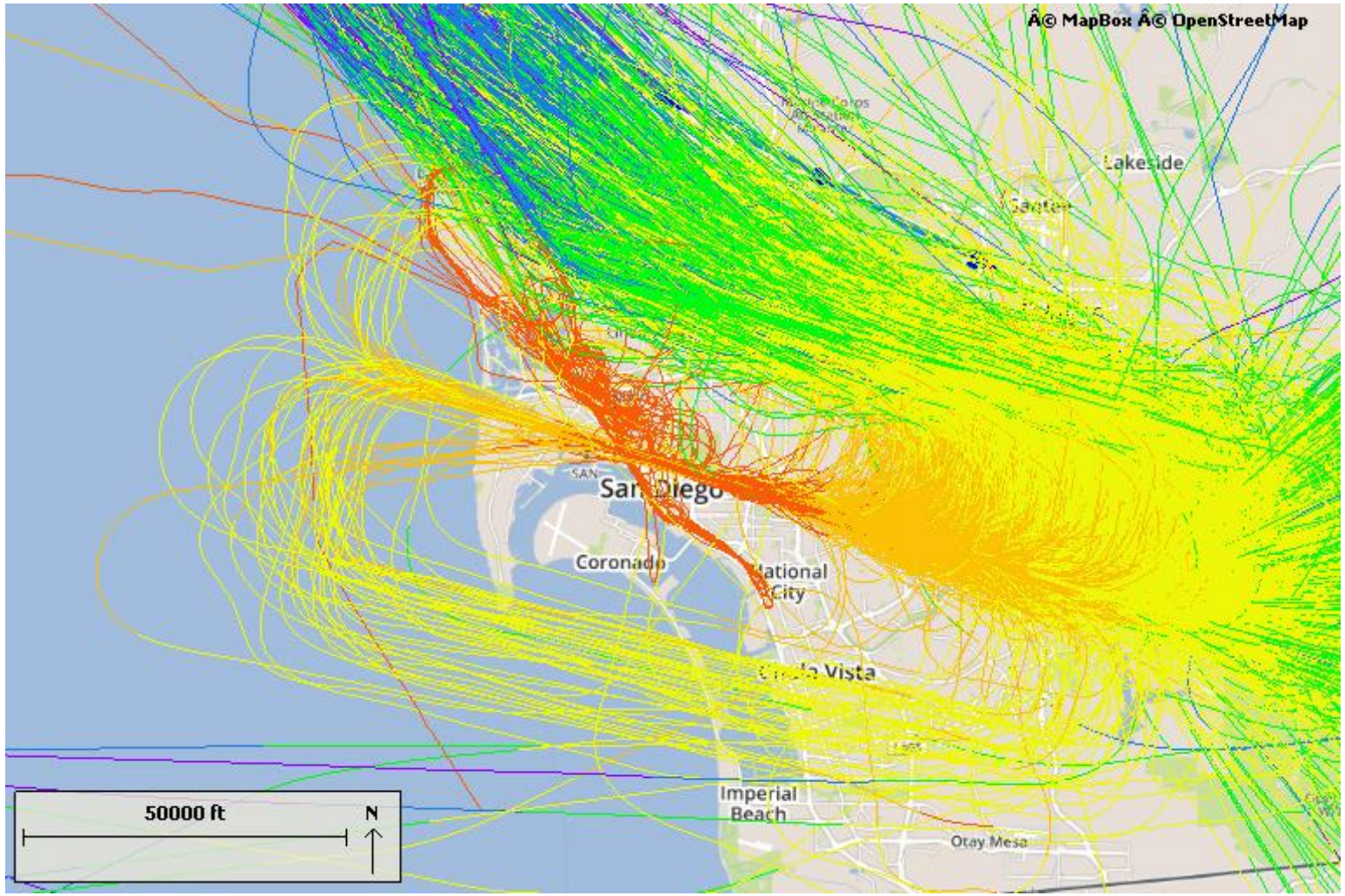
Track Density Ranges
(count of operations)

1	4	< 1 per day
5	9	
10	15	
16	20	
21	25	
26	30	
31	50	1-2 per day
51	75	
76	100	2-5 per day
101	150	
151	13,950	>5 per day

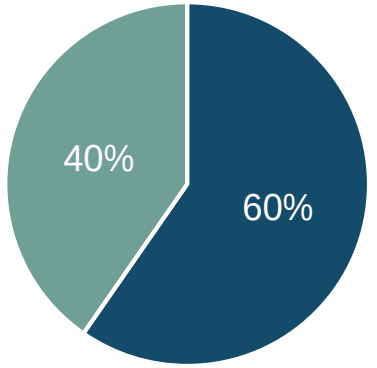
SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Note: Total Runway 27 arrivals was 7,547 for November 2016

Runway 27 Arrivals - Flight Tracks by Altitude
San Diego Metropolitan Area - July 2017



Percentage of Arrivals from North/Northwest and East



East North/Northwest

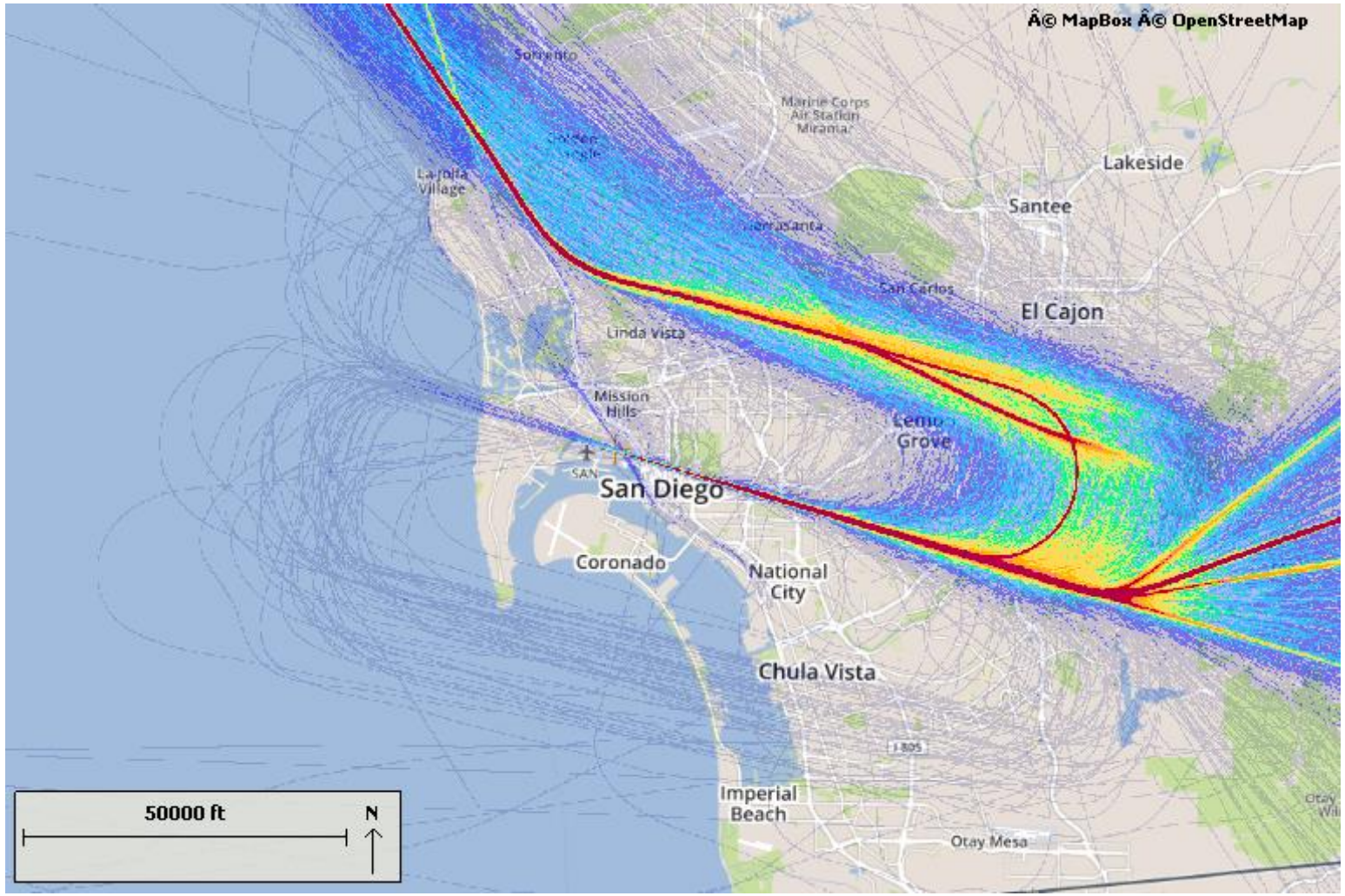
Track Altitude Ranges
(feet above SDIA airfield elevation)

< 2,000	
2,000-4,000	
4,000-6,000	
6,000-8,000	
8,000-10,000	
> 10,000	

SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

NOTES: SDIA airfield elevation is 17 feet MSL; Total Runway 27 arrivals was 9,642 for July 2017

Runway 27 Arrivals - Flight Track Density Analysis
San Diego Metropolitan Area - July 2017



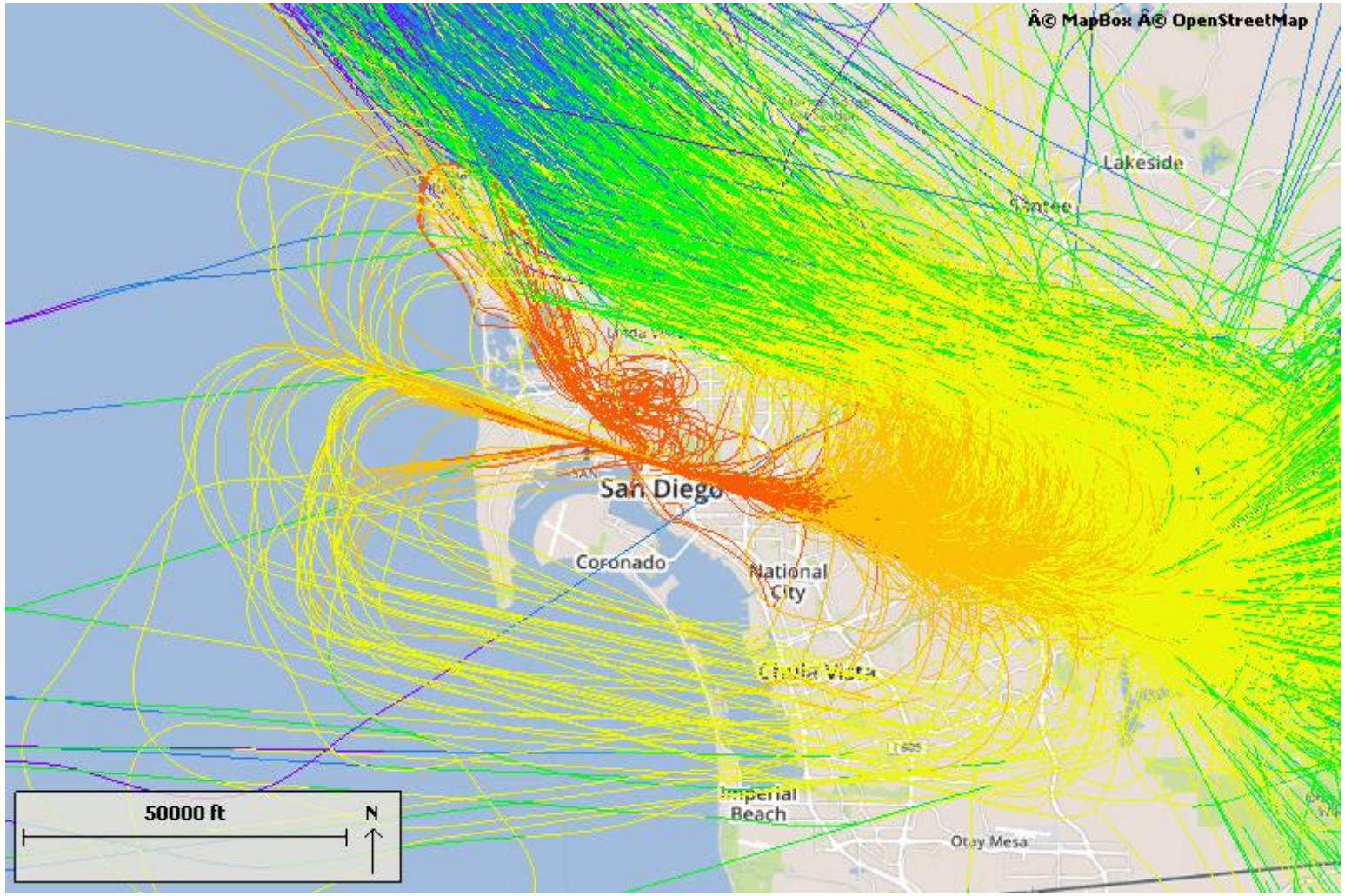
Track Density Ranges
(count of operations)

1	4	< 1 per day
5	9	
10	15	
16	20	
21	25	
26	30	
31	50	1-2 per day
51	75	
76	100	2-5 per day
101	150	
151	13,950	>5 per day

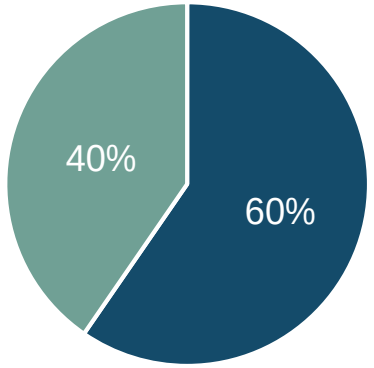
SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Note: Total Runway 27 arrivals was 9,642 for July 2017

Runway 27 Arrivals - Flight Tracks by Altitude
San Diego Metropolitan Area - July 2018



Percentage of Arrivals from North/Northwest and East



East North/Northwest

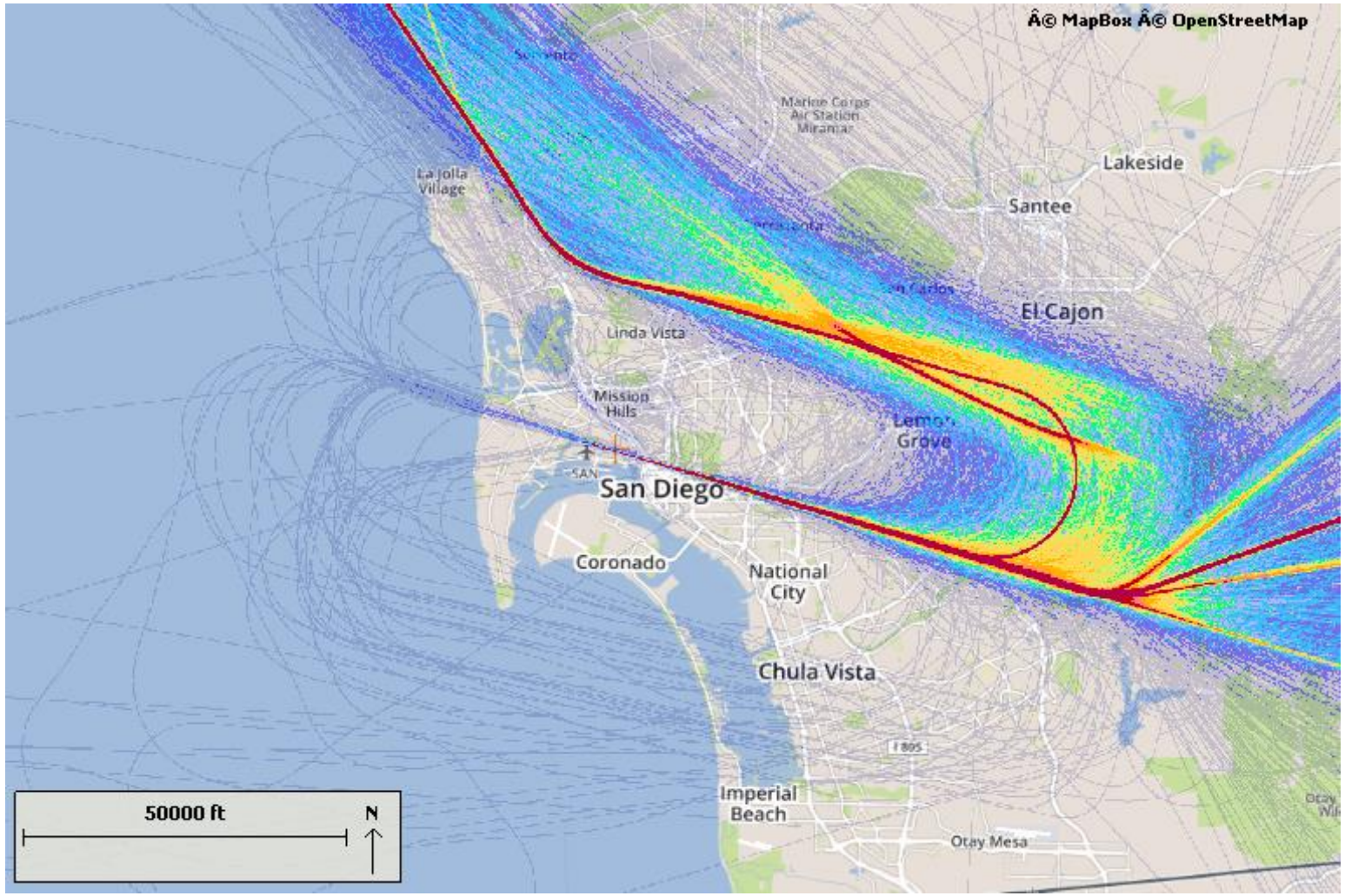
Track Altitude Ranges
(feet above SDIA airfield elevation)

< 2,000	
2,000-4,000	
4,000-6,000	
6,000-8,000	
8,000-10,000	
> 10,000	

SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

NOTES: SDIA airfield elevation is 17 feet MSL; Total Runway 27 arrivals was 10,012 for July 2018

Runway 27 Arrivals - Flight Track Density Analysis
San Diego Metropolitan Area - July 2018



Track Density Ranges
(count of operations)

1	4	< 1 per day
5	9	
10	15	
16	20	
21	25	
26	30	
31	50	1-2 per day
51	75	
76	100	2-5 per day
101	150	
151	13,950	>5 per day

SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Note: Total Runway 27 arrivals was 10,012 for July 2018

Understanding East County Concerns related to Aircraft Noise and Overflights

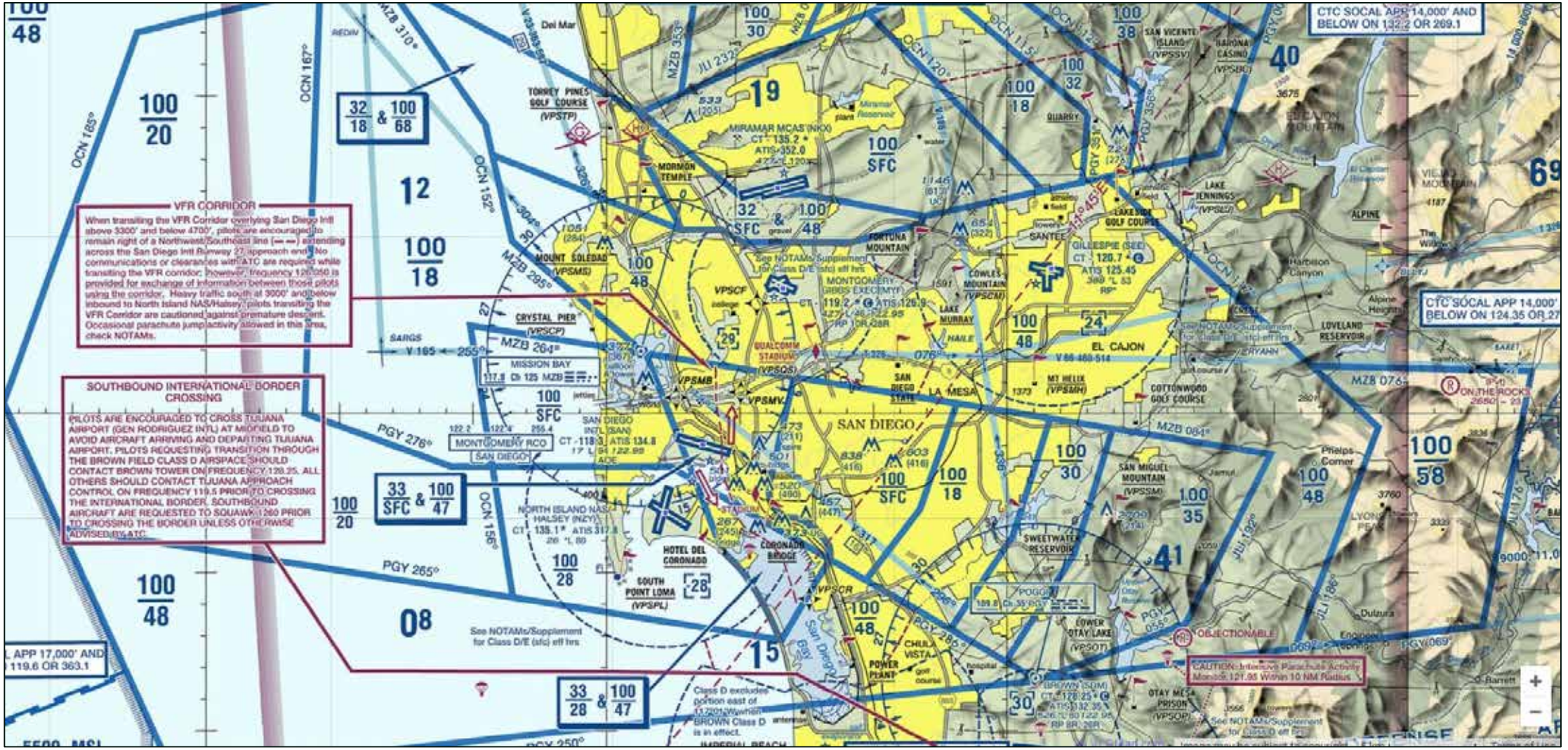
Class B and Existing Published Flight Procedures

Class B Airspace

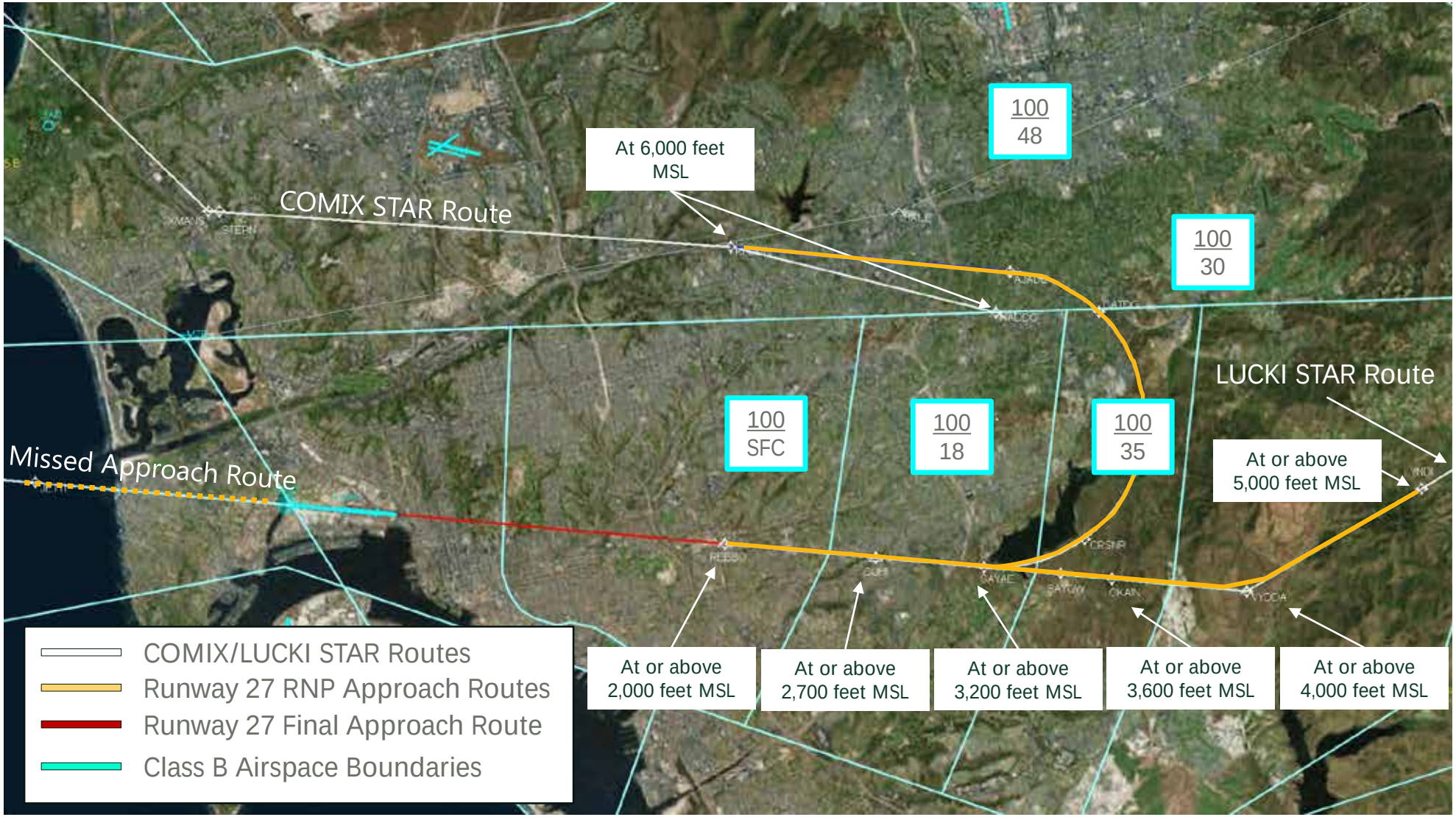
- Controlled (radar monitored by a controller and in contact with pilot) airspace from the ground to 10,000 feet MSL surrounding each of the nation's busiest airports, including SDIA.
- The configuration of each Class B airspace area is individually tailored to contain operations below 10,000 feet MSL to/from a major airport, and is defined three-dimensionally with multiple layers (some Class B airspace areas resemble upside-down wedding cakes).
- Operating Rules and Pilot/Equipment Requirements:
  - 1. ATC Clearance. Regardless of weather conditions, an ATC clearance is required prior to operating within Class B airspace.
  - 2. Pilot Certification.
  - 3. Equipment. (a) Two-way radio; and (b) Unless otherwise authorized by ATC, an operable radar beacon transponder with automatic altitude reporting equipment.
- Class B airspace is charted on Sectional Charts, Instrument Flight Rule (IFR) En Route Low Altitude charts, and Terminal Area Charts where appropriate.

Reference Aeronautical Information Manual (AIM) Paragraph 3-2-3

San Diego Class B Airspace



East County SAN Northwest Arrivals – Published Procedures and Class B Airspace

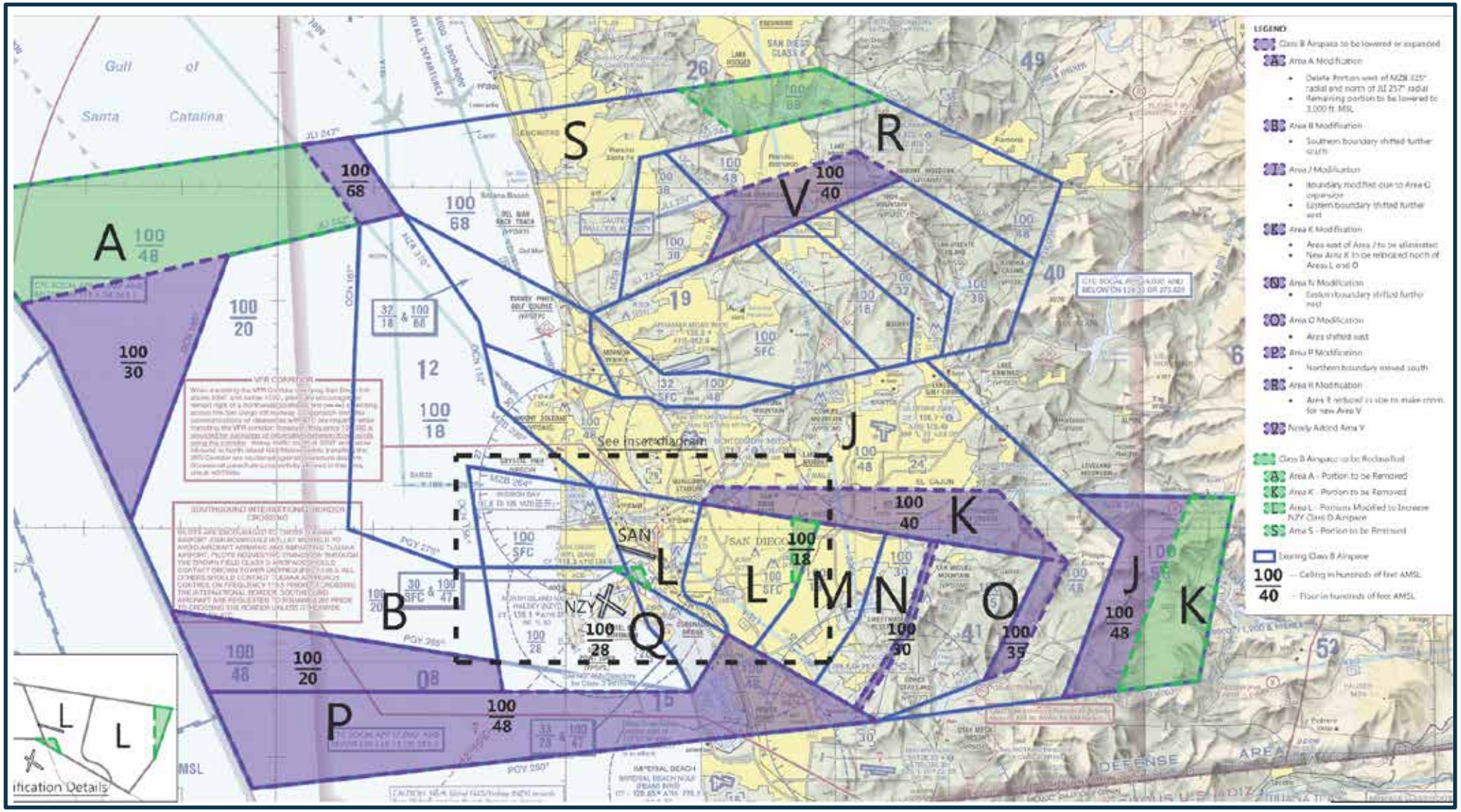


Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground

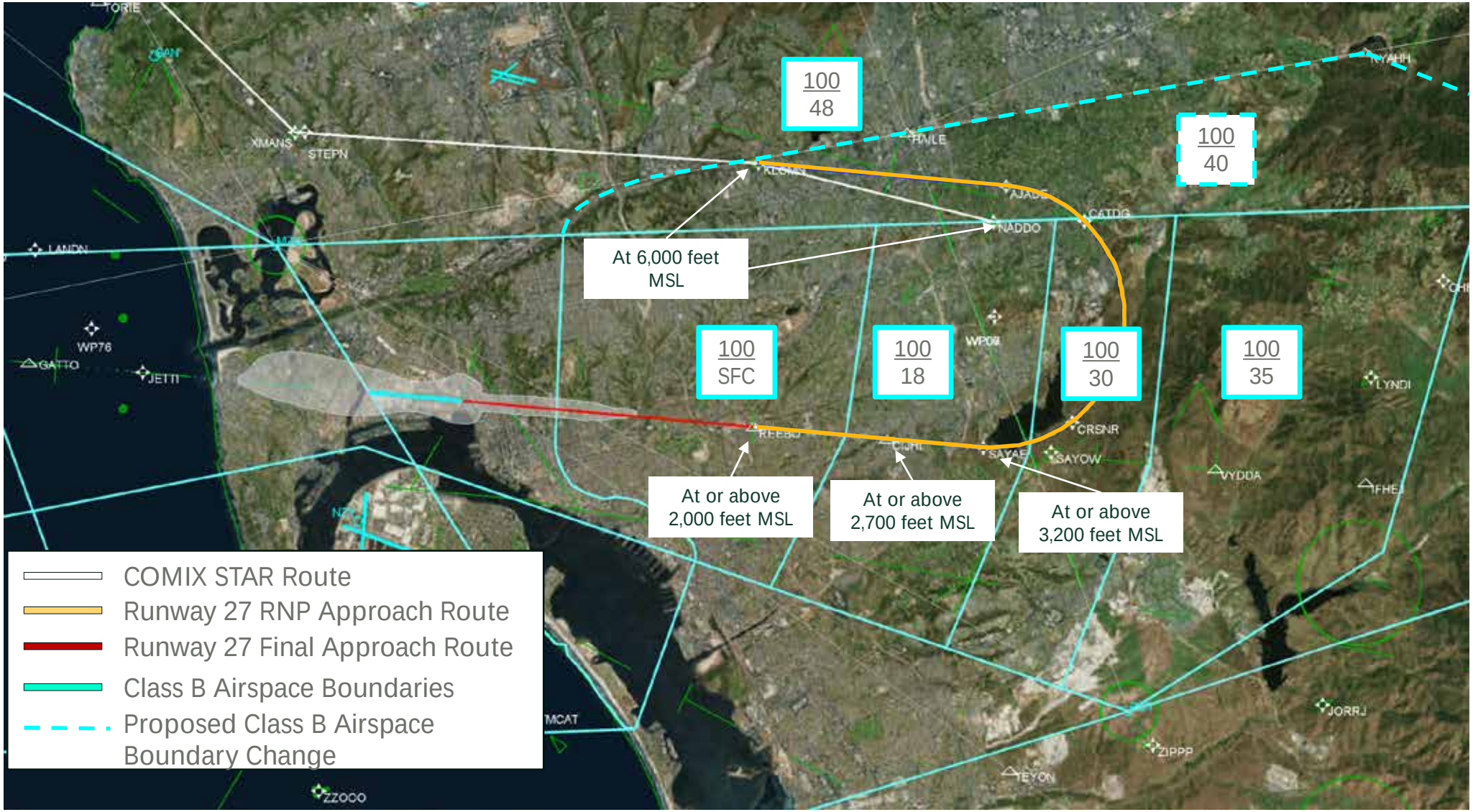
Understanding East County Concerns related to Aircraft Noise and Overflights

Potential Future Changes

East County Arrivals Slide – Class B Airspace Redesign



East County SAN Northwest Arrivals – Procedures and Class B Airspace



Understanding East County Concerns related to Aircraft Noise and Overflights

Workgroup Concerns – Open Discussion

Next Steps

Next Steps

- Review issues/concerns and consolidate
- Assess potential high level concepts to address concerns

RICONDO®

San Diego International Airport
East County Working Group - Aircraft Noise Concerns

Meeting #2

PRESENTED TO:
SDIA East County Working Group

PRESENTED BY:
Stephen C. Smith

PRESENTED ON:
January 24, 2019

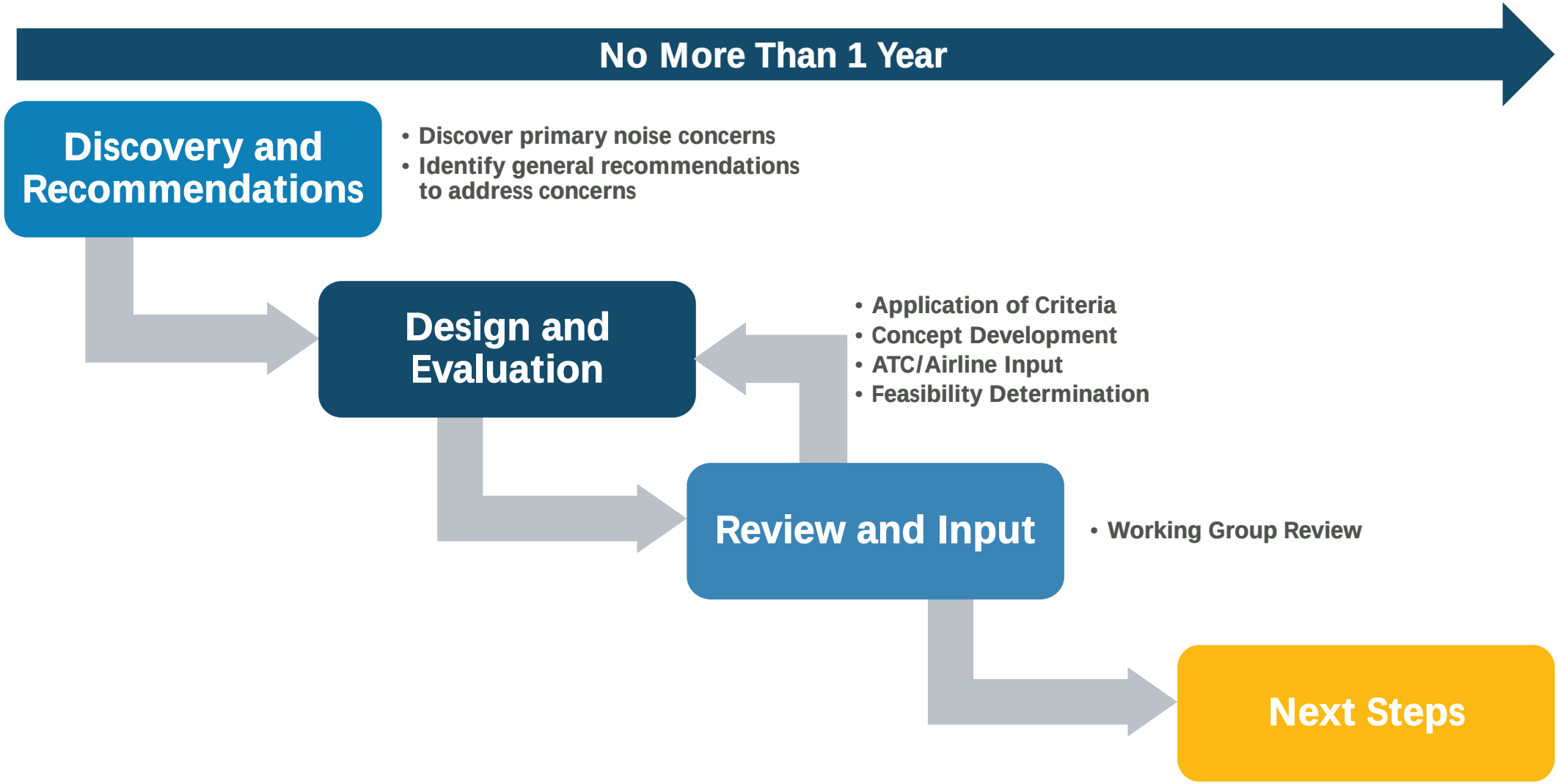
Agenda

- Introductions
- Process Overview Refresher
- Meeting Objective
- Overview of East County Concerns
- November 2016 Arrival Procedure Change
- Noise Abatement Options
- Ideas to Address Concerns
- Next Steps

Introductions

- East County Working Group Facilitator
  - Ms. Heidi Gantwerk
- San Diego County Regional Airport Authority (Airport Authority)
  - Owns and operates the airport
  - Main Contact: Ms. Sjohnna Knack, Program Manager
- Flight Procedure Analysis Consultant Team
  - Project Lead: Mr. Stephen Smith
  - Ricondo & Associates, Inc.
- East County Working Group Members

Process Overview Refresher



SOURCE: : Ricondo and Associates, Inc., November 2018.

Meeting Objective

- Confirm overall noise concerns/issues for East County
- Understand FAA change to arrival procedure for arrivals from the north
- Understand approach requirements for arrivals to Runway 27
- Understand methods to address aircraft noise concerns
- Discover viable ideas to address concerns

Understanding East County Concerns related to Aircraft Noise and Overflights

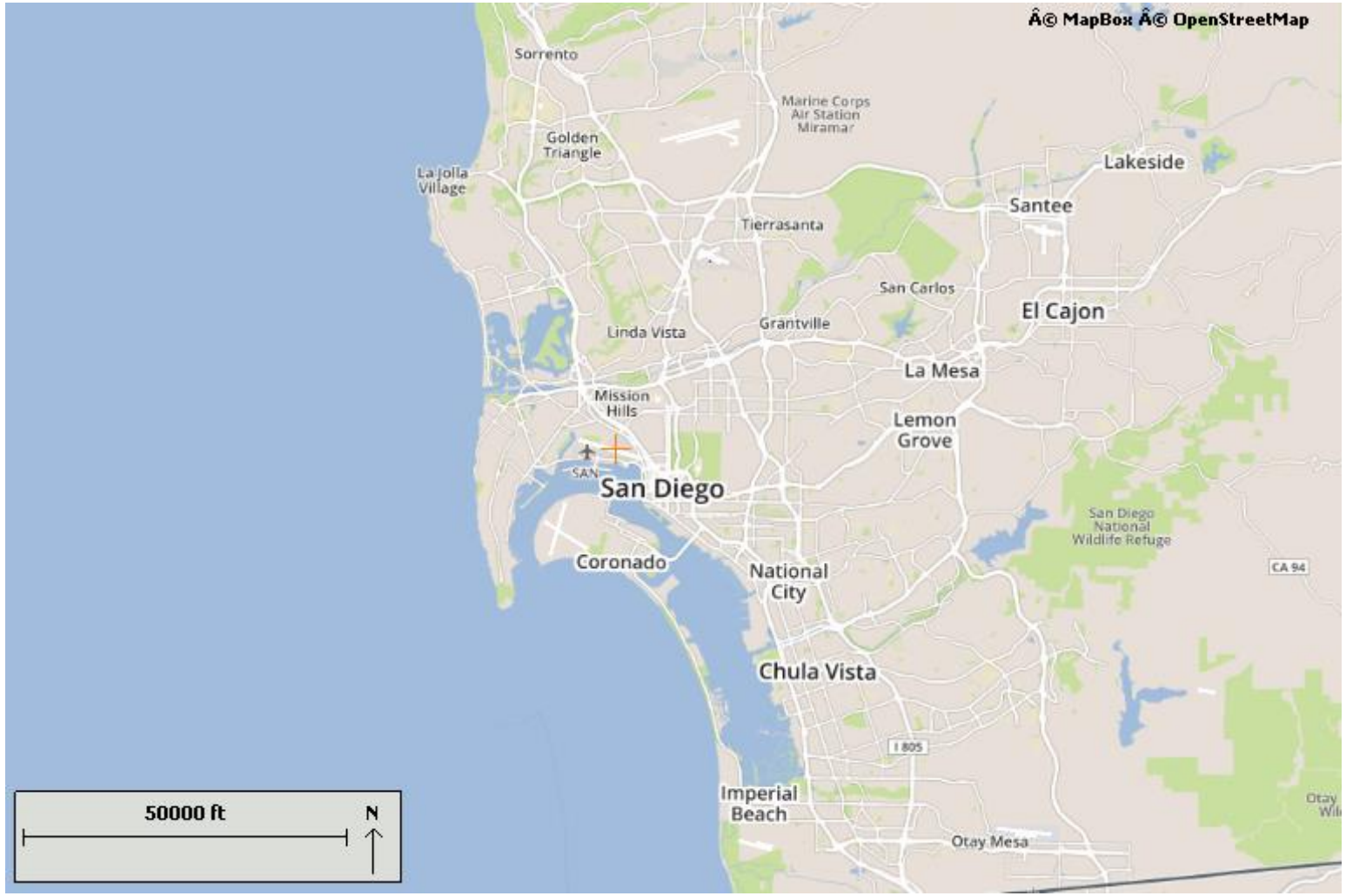
Overview of Working Group Concerns

Overview of Working Group Concerns

- Change in traffic patterns
- Hearing more noise early morning (6:30 a.m. to 11:00 a.m.) and at night (10:00 p.m. to 11:00 p.m.)
- Do not increase noise in other areas
- Low flying aircraft
- Increase in overflight frequency

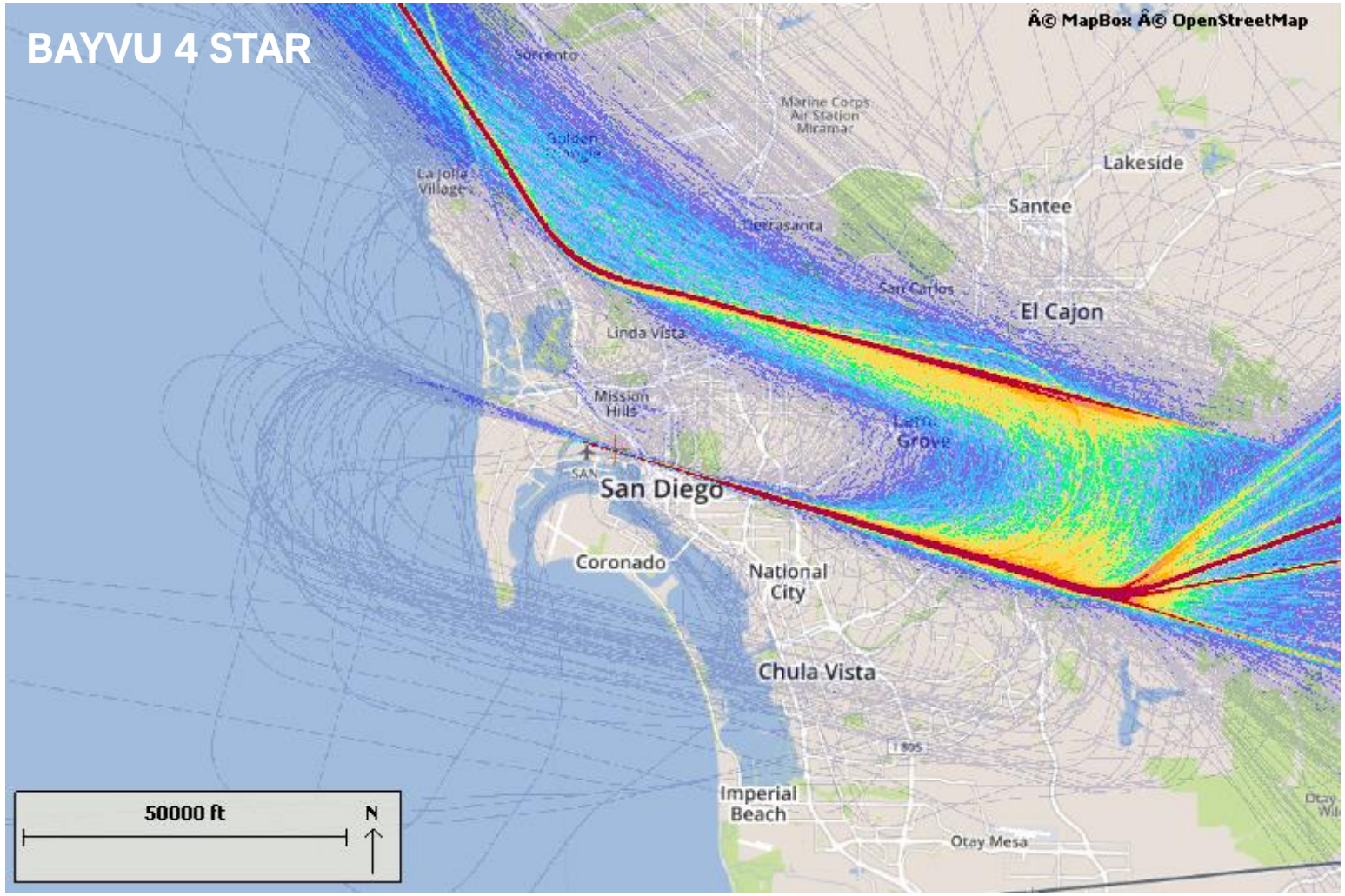
Air Traffic Procedure Change on November 2016

Runway 27 Arrivals - Flight Tracks
San Diego Metropolitan Area - July 2014



SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Runway 27 Arrivals - Flight Track Density Analysis
San Diego Metropolitan Area - July 2016



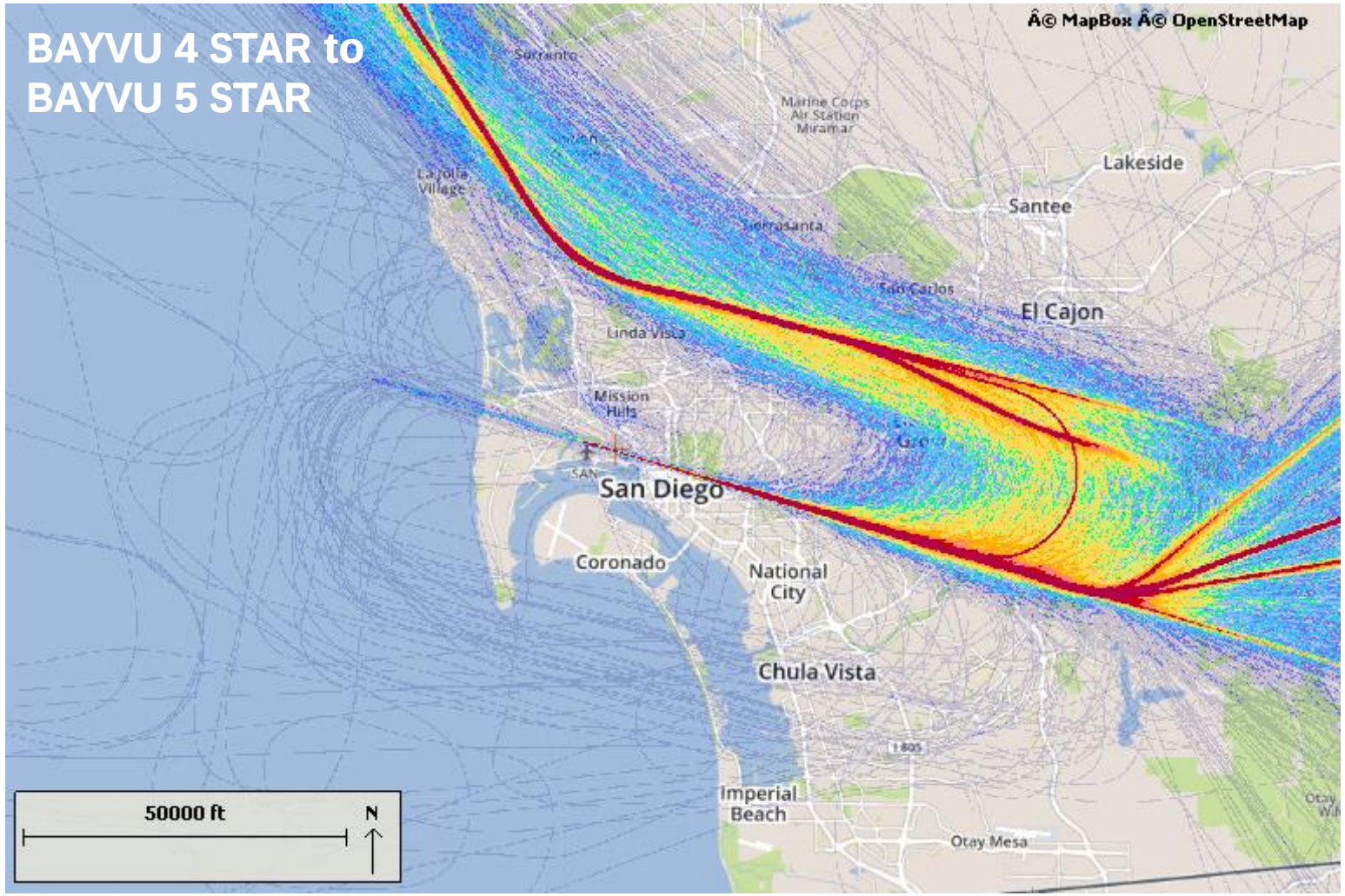
Track Density Ranges
(count of operations)

1	4	< 1 per day
5	9	
10	15	
16	20	
21	25	
26	30	
31	50	1-2 per day
51	75	
76	100	2-5 per day
101	150	
151	13,950	>5 per day

SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Note: Total Runway 27 arrivals was 8,887 for July 2016

Runway 27 Arrivals - Flight Track Density Analysis
San Diego Metropolitan Area - November 2016



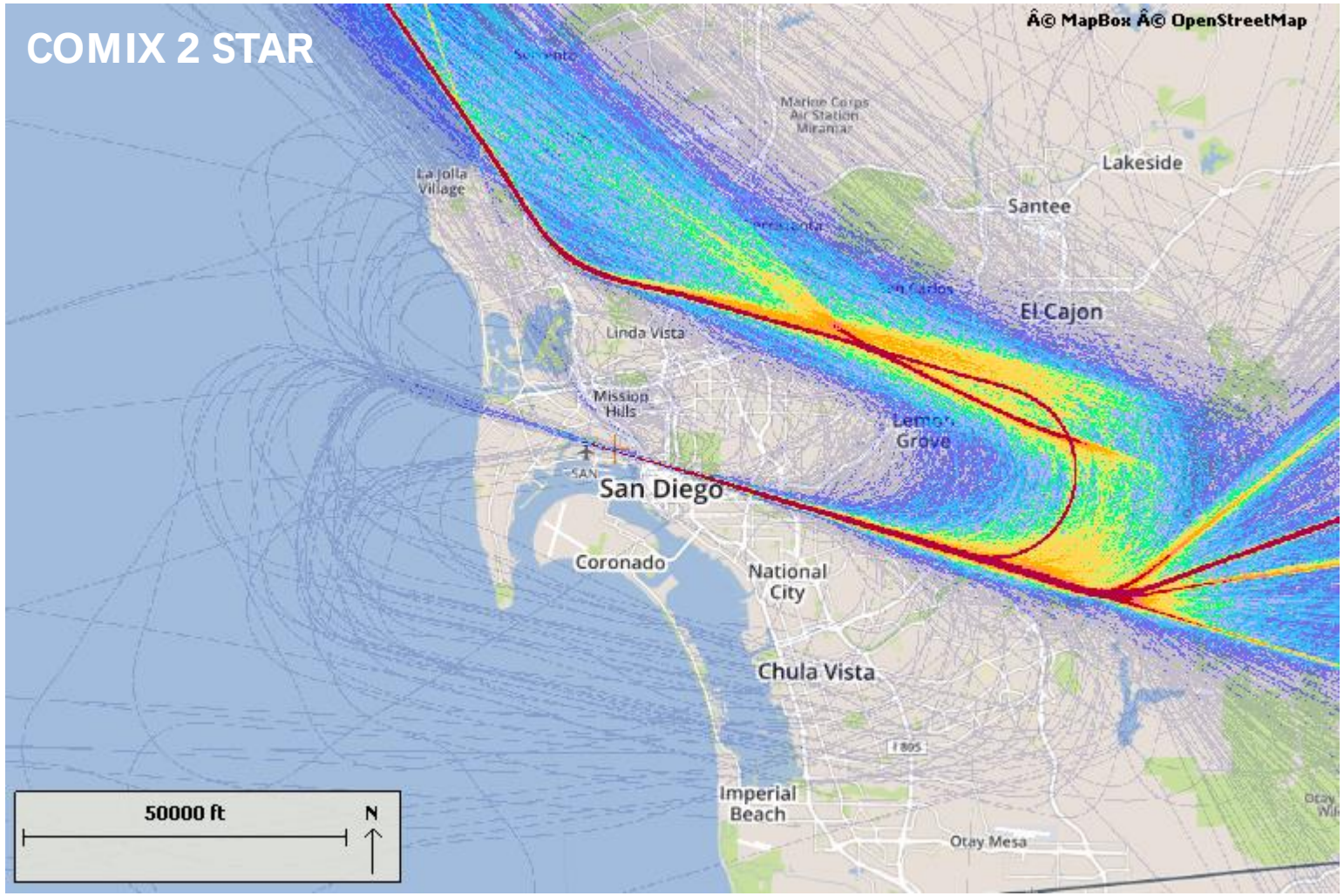
Track Density Ranges
(count of operations)

1	4	< 1 per day
5	9	
10	15	
16	20	
21	25	
26	30	
31	50	1-2 per day
51	75	
76	100	2-5 per day
101	150	
151	13,950	>5 per day

SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Note: Total Runway 27 arrivals was 7,547 for November 2016

Runway 27 Arrivals - Flight Track Density Analysis
San Diego Metropolitan Area - July 2018



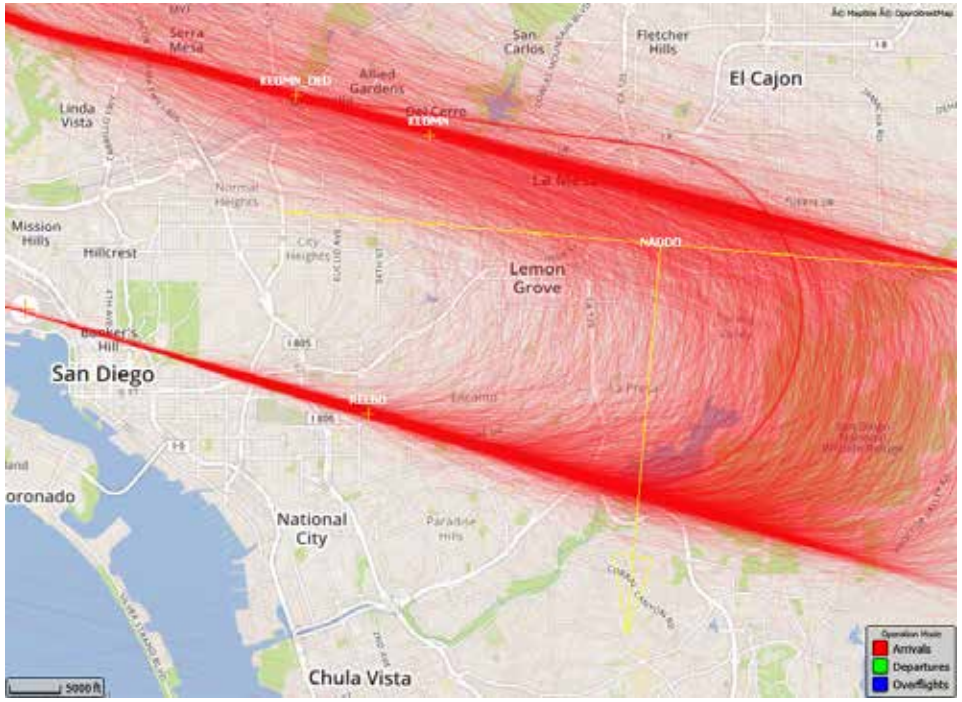
Track Density Ranges
(count of operations)

1	4	< 1 per day
5	9	
10	15	
16	20	
21	25	
26	30	
31	50	1-2 per day
51	75	
76	100	2-5 per day
101	150	
151	13,950	>5 per day

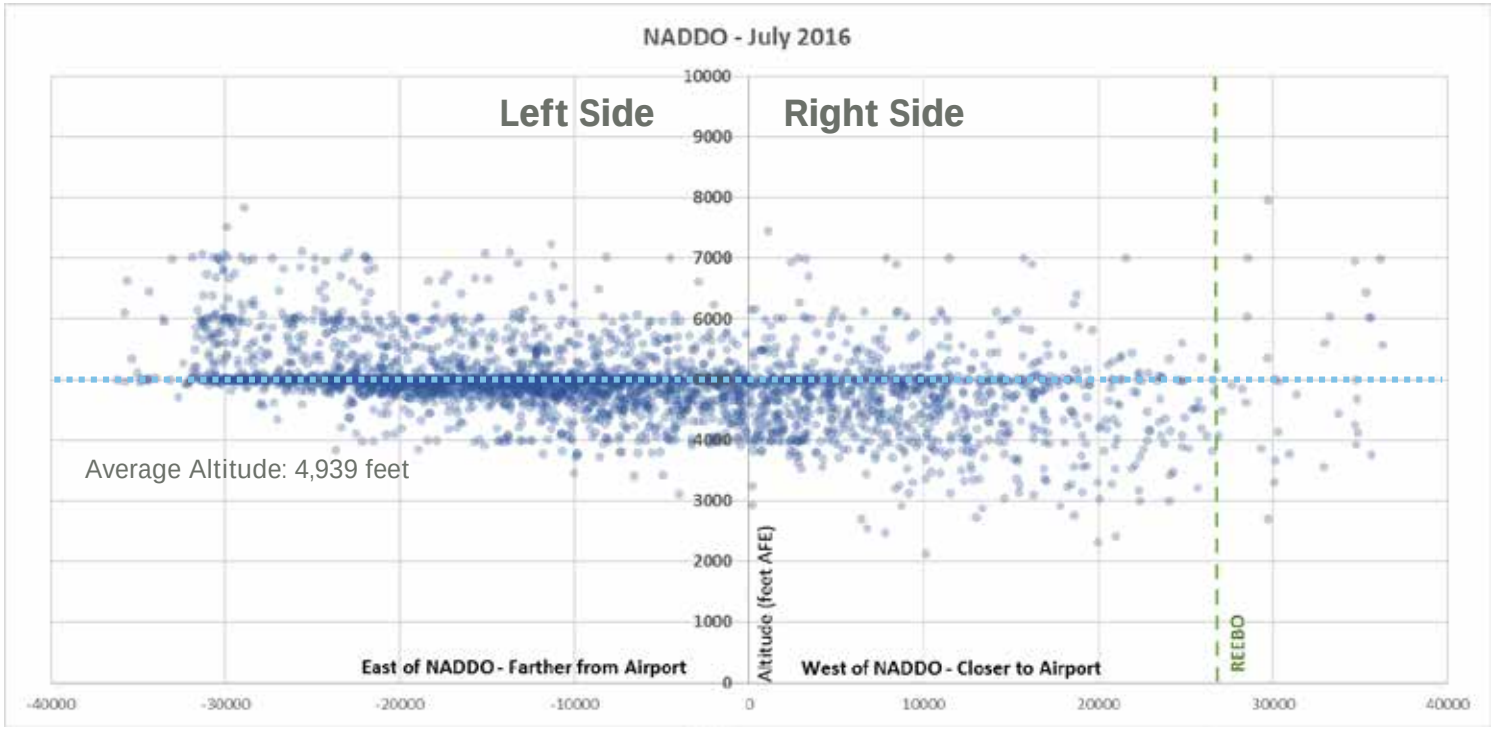
SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Note: Total Runway 27 arrivals was 10,012 for July 2018

Runway 27 Arrivals – Altitude Gate Analysis Near NADDO
San Diego Metropolitan Area - July 2016

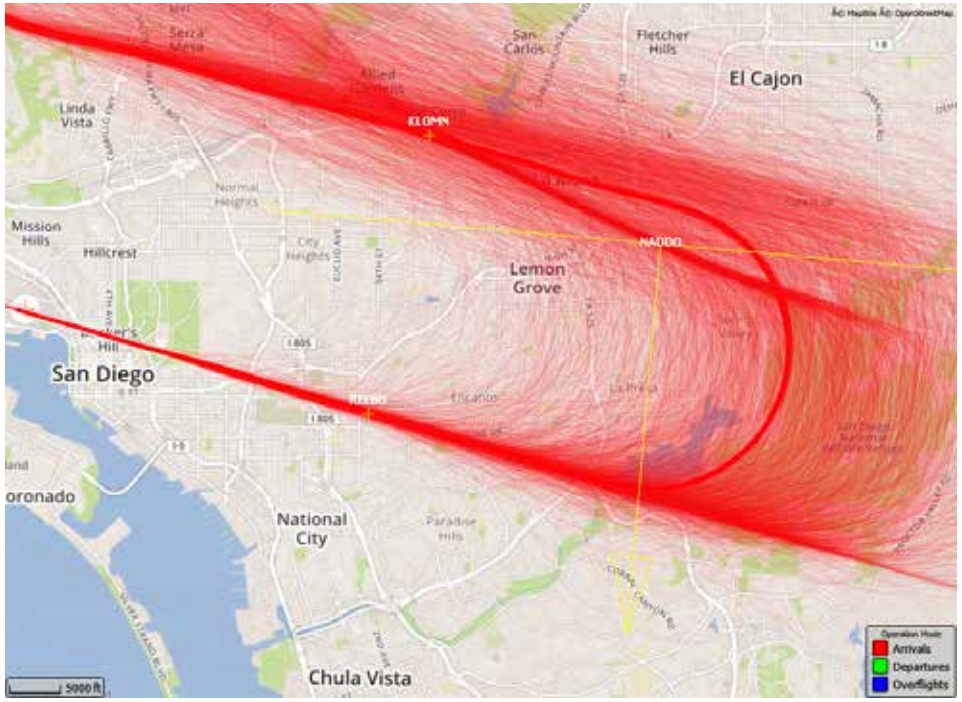


Note: track transparency set at 70%

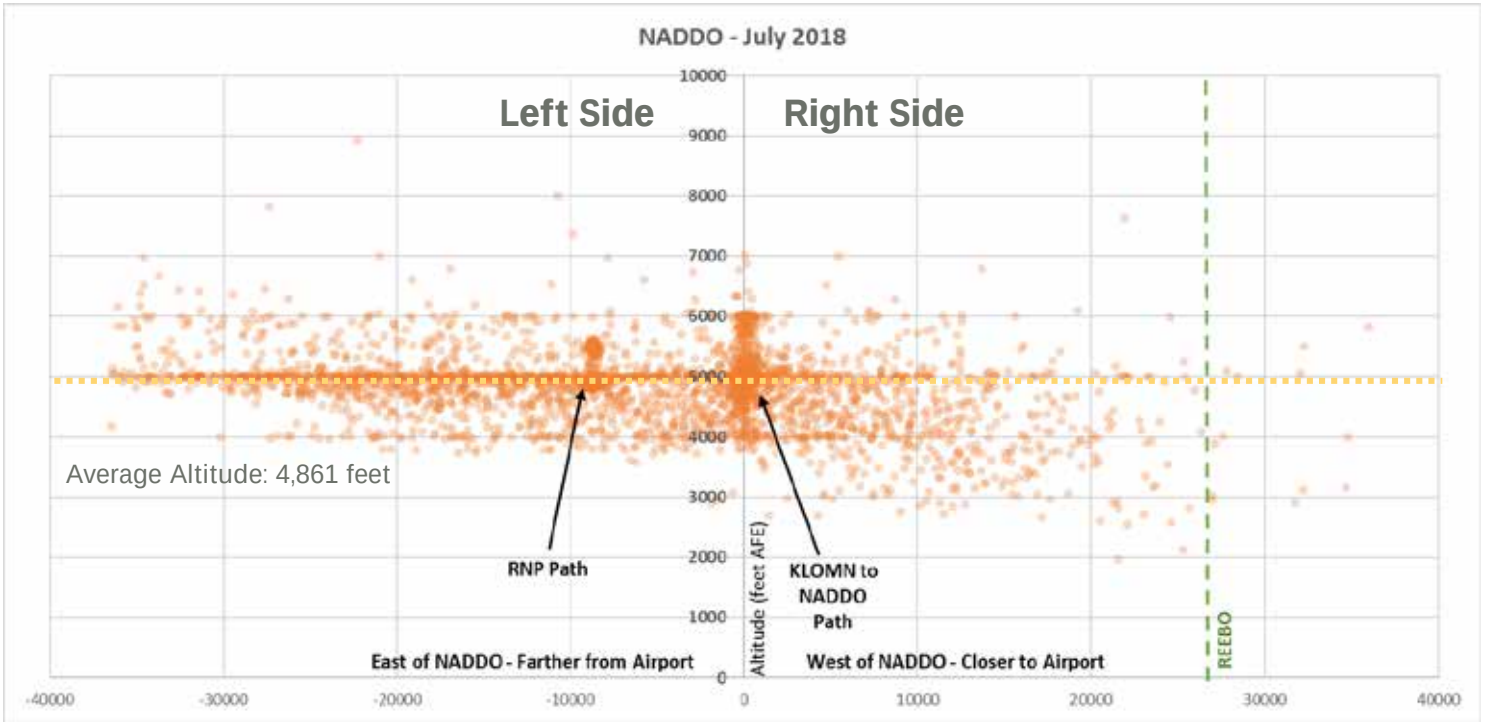


SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, January 2019.

Runway 27 Arrivals – Altitude Gate Analysis Near NADDO
San Diego Metropolitan Area - July 2018



Note: track transparency set at 70%



SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, January 2019.

Runway 27 Arrivals – Altitude Gate Analysis Near NADDO
San Diego Metropolitan Area - July 2018 vs July 2016

SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, January 2019.

Noise Abatement Options

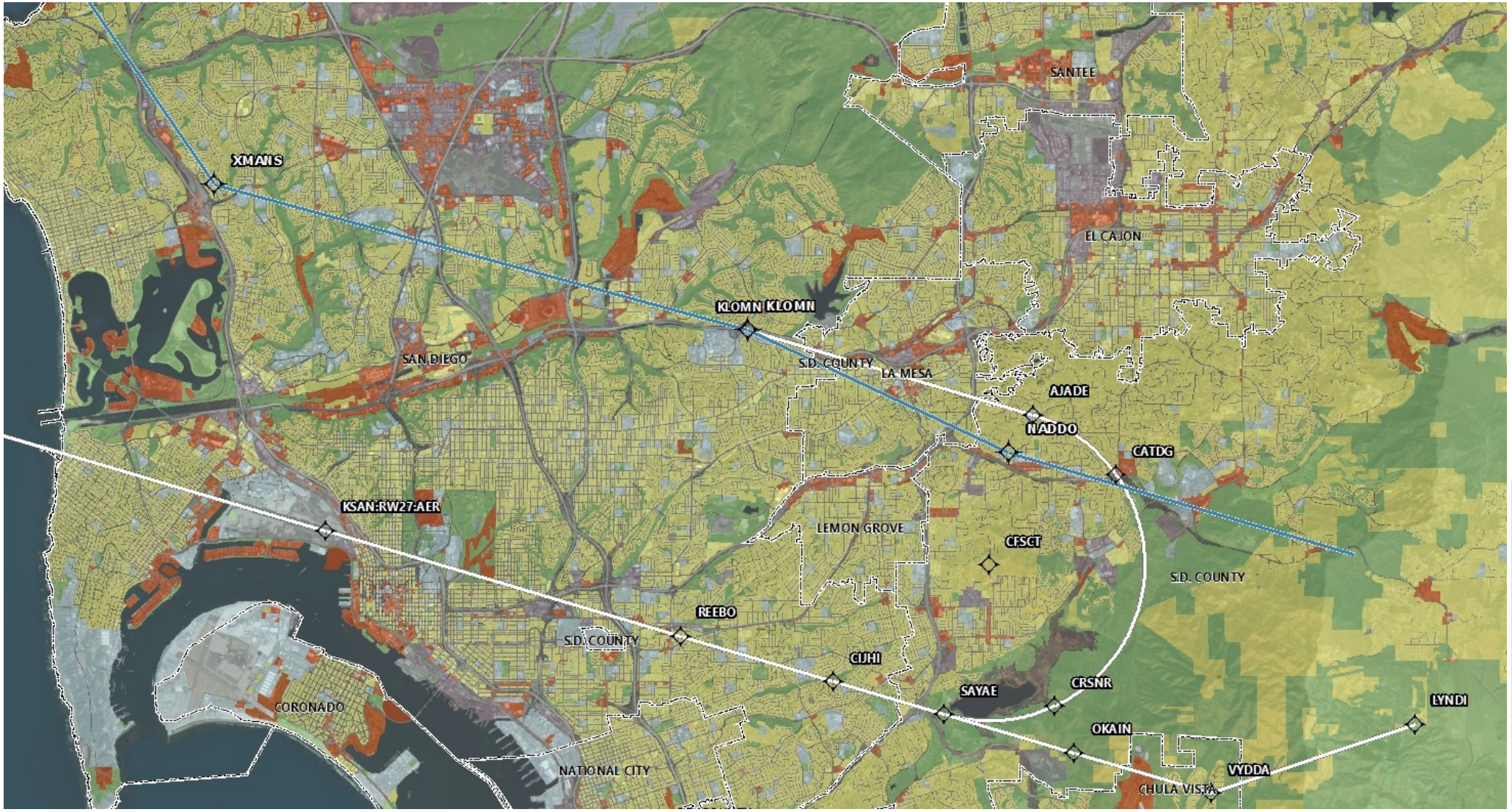
Parameters

- Do not change aircraft flight paths that affect area exposed to CNEL 65 or higher
- Do not impact safety
- Meet FAA design criteria and air traffic control requirements
- Fit within existing airspace
- Do not impact capacity of SDIA
- Do not move noise to new non-compatible areas

Noise Abatement Options

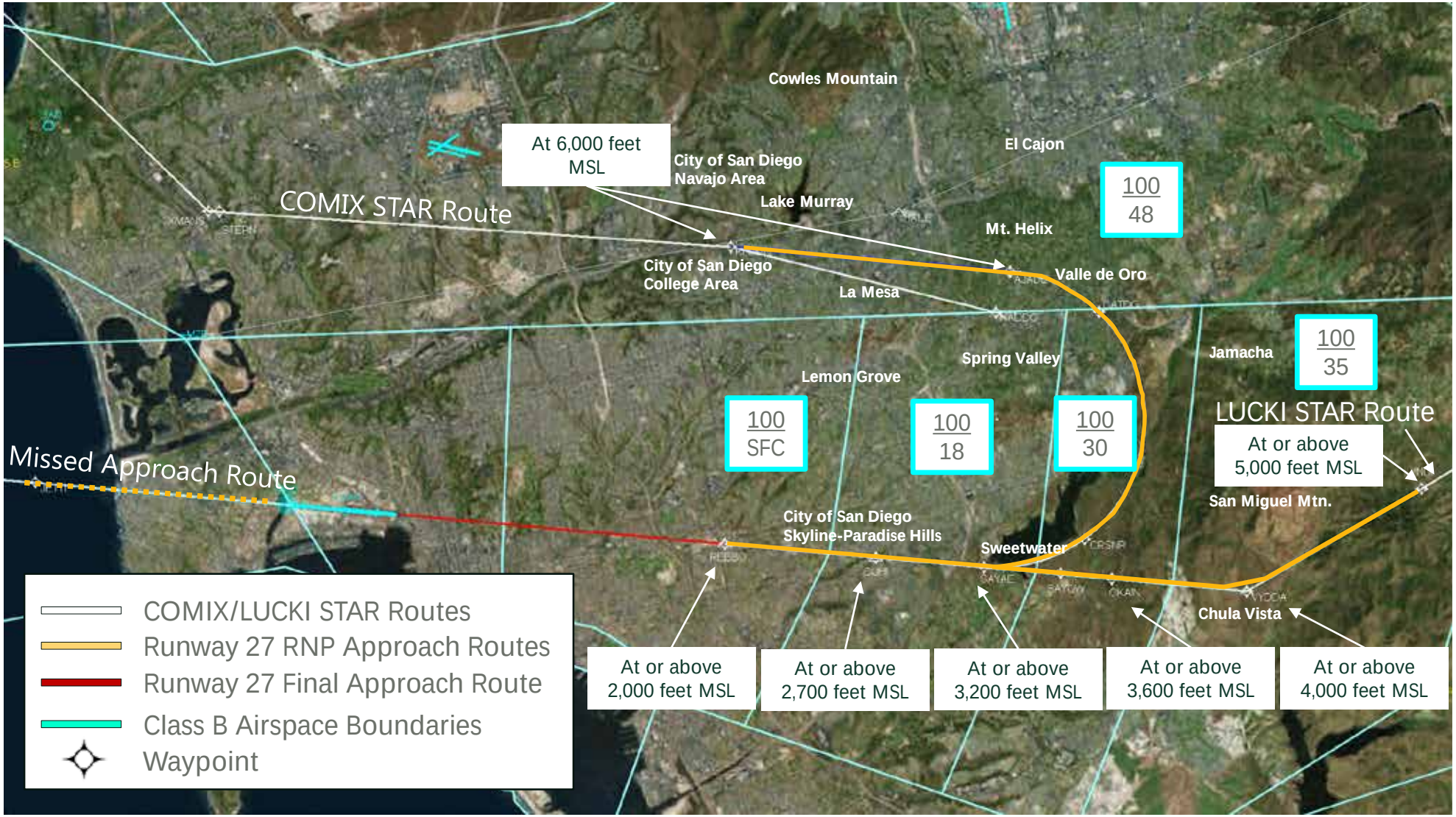
- Procedure route location
- Altitude
- Dispersion or Concentration

Procedure Route Location



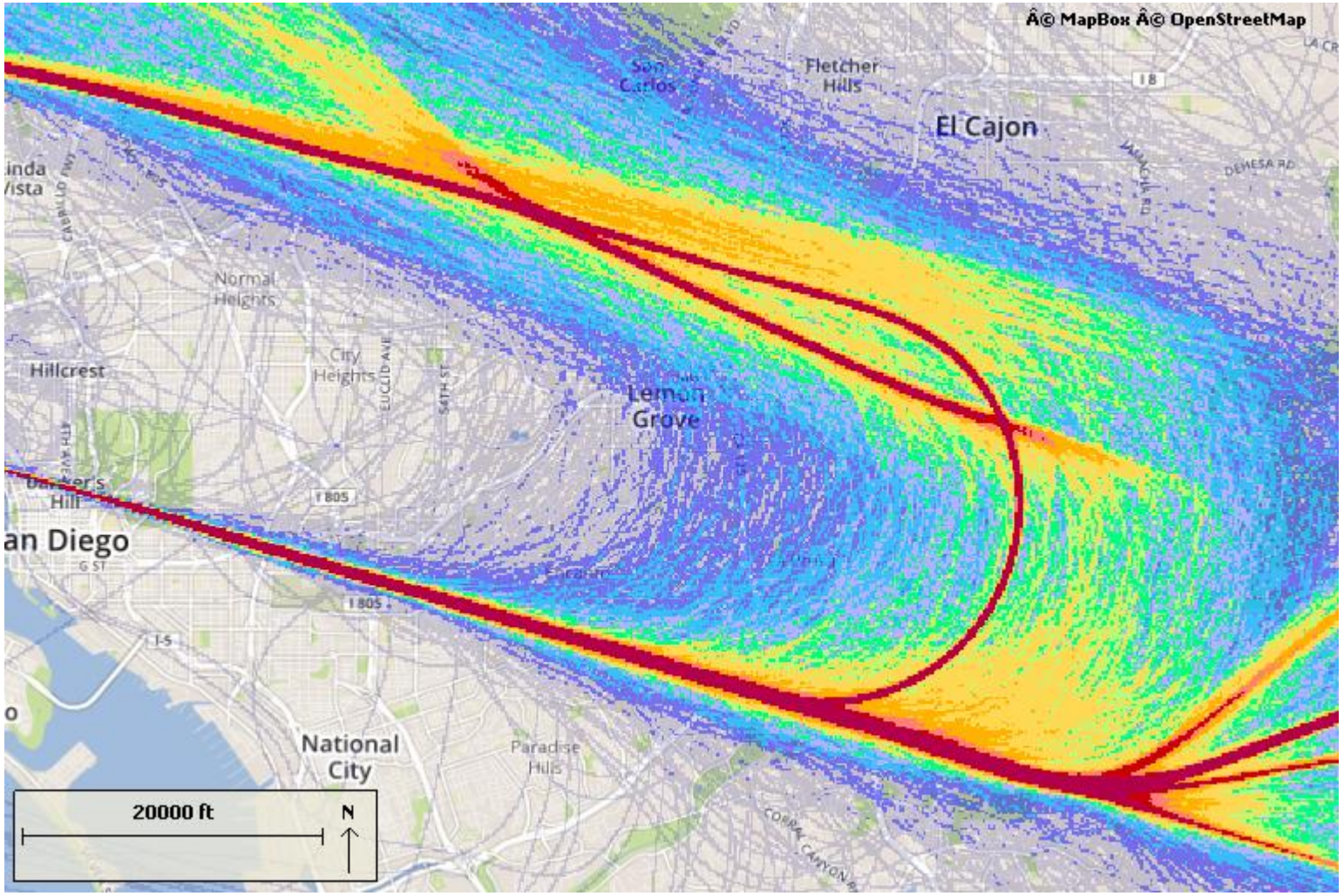
SOURCE: : San Diego Geographic Information Source (SanGIS), based on SANDAG, Local City and County General and Community Plan Land Use Elements, SanGIS land base (i.e. parcels), October 2014 (planned land use).; flight procedure routes based on Federal Aviation Administration, National Flight Data Center, November 2018..

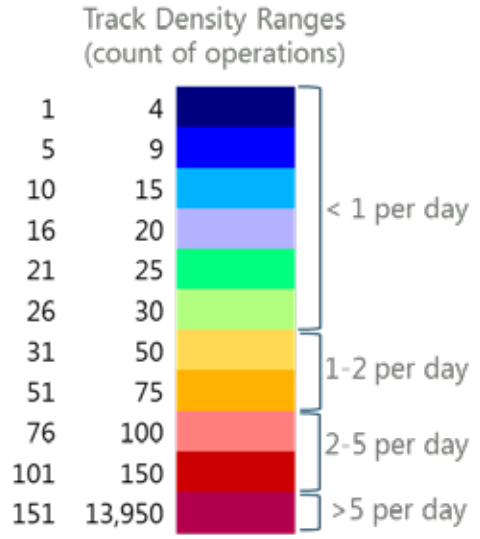
Altitude



NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Flight procedure routes based on :Federal Aviation Administration, National Flight Data Center, November 2018.

Dispersion or Concentration

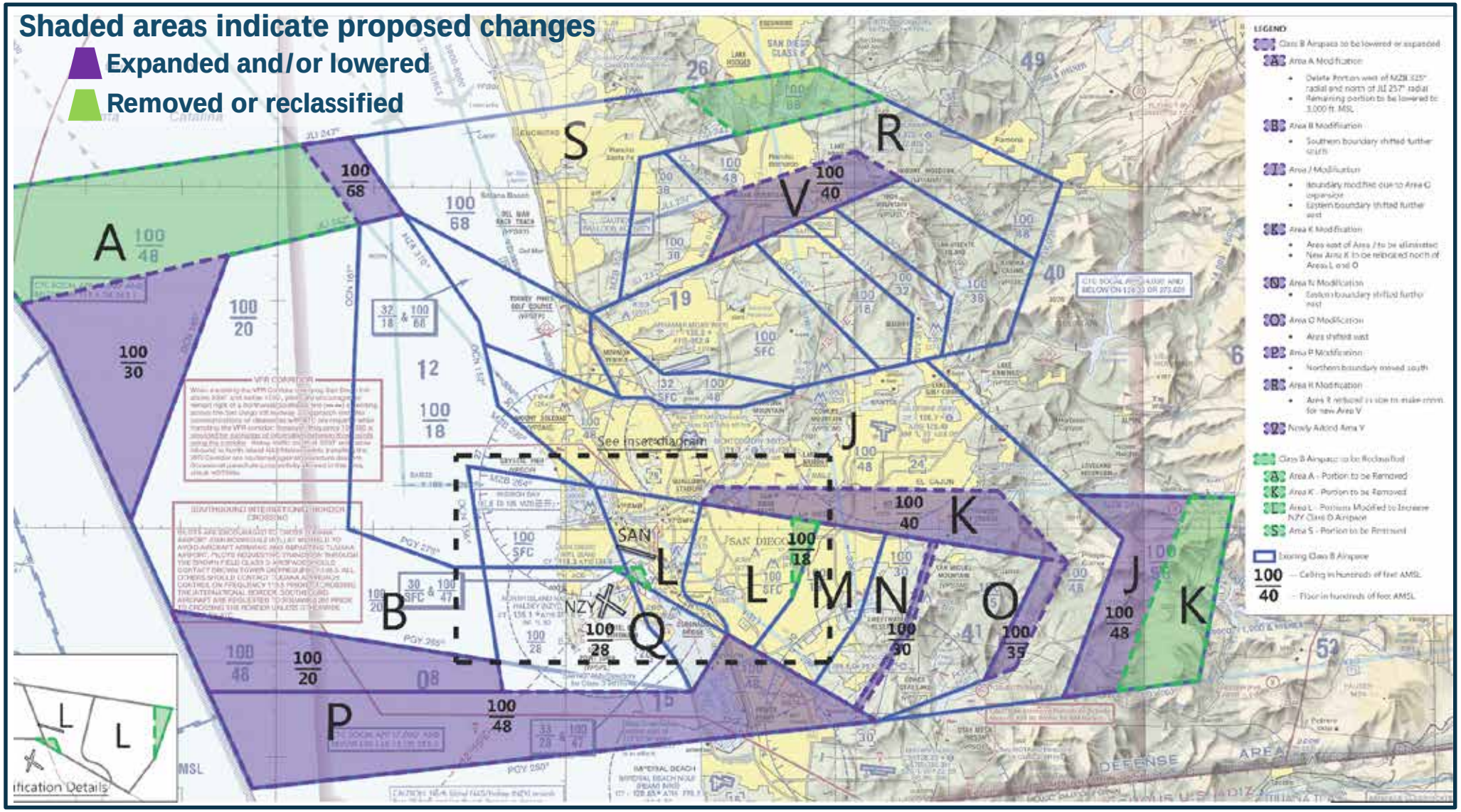




NOTE: Depicts track density for all Runway 27 arrivals in July 2018
SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Ideas to Address Concerns

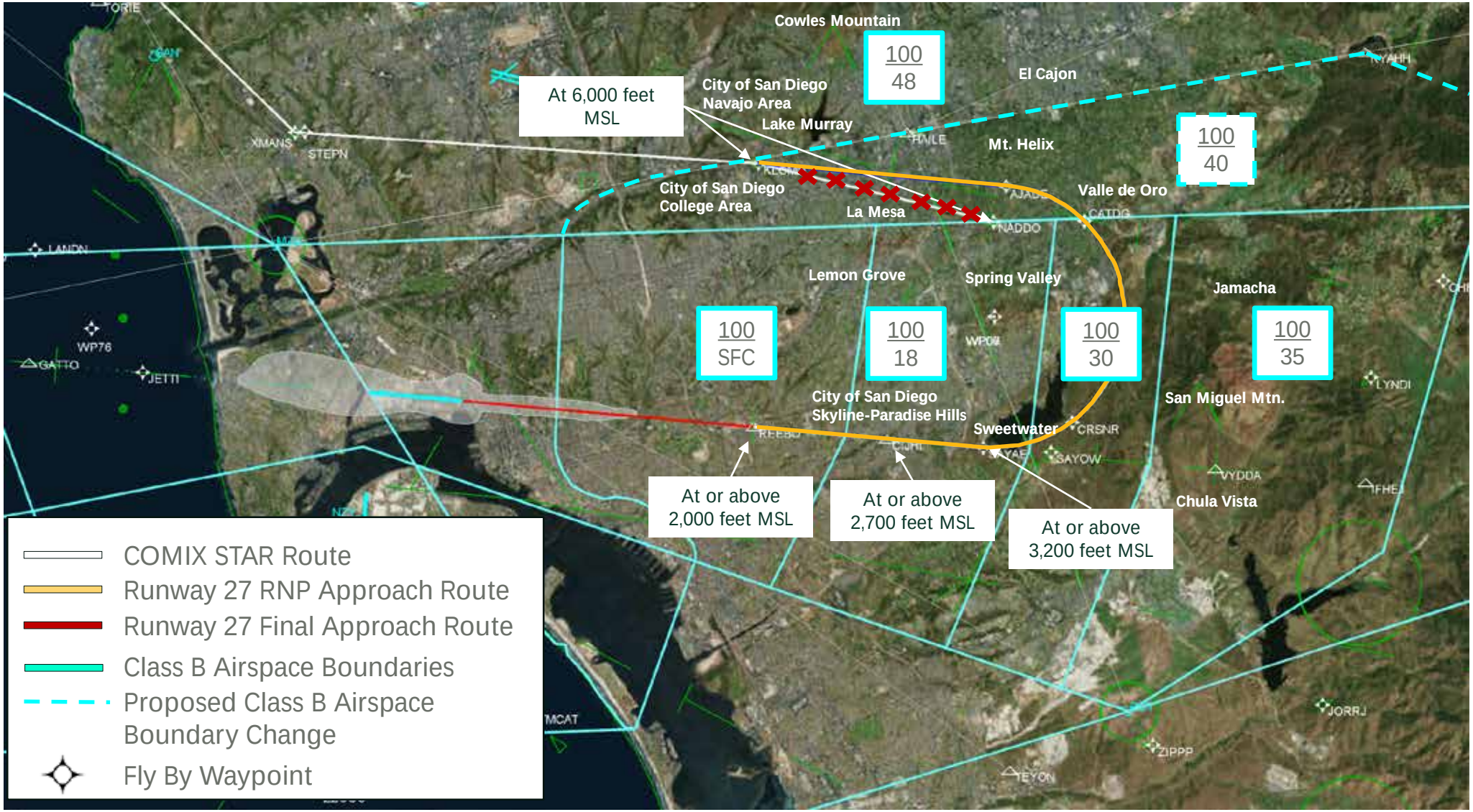
FAA Class B Airspace Proposed Redesign



NOTE: Altitudes are Mean Sea Level (MSL) – height above sea level

SOURCE: Proposed Class B changes based on Federal Aviation Administration, *San Diego Class B Airspace Modification Staff Study.* December 2012.

Remove Route Between KLOMN and NADDO Waypoint (after Class B Change)



NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground

SOURCE: Flight procedure routes based on :Federal Aviation Administration, National Flight Data Center, November 2018; proposed Class B changes based on Federal Aviation Administration, *San Diego Class B Airspace Modification Staff Study.* December 2012.

Sweetwater Visual Approach

SOURCE: Flight procedure routes based on :Federal Aviation Administration, National Flight Data Center, November 2018.

Next Steps

Next Steps

- Develop Working Group recommendations
- Consultant Team meet with FAA Southern California Terminal Radar Approach Control to gather feedback on recommendations

RICONDO®

San Diego International Airport
East County Working Group - Aircraft Noise Concerns

Meeting #3

PRESENTED TO:
SDIA East County Working Group

PRESENTED BY:
Stephen C. Smith

PRESENTED ON:
May 28, 2019

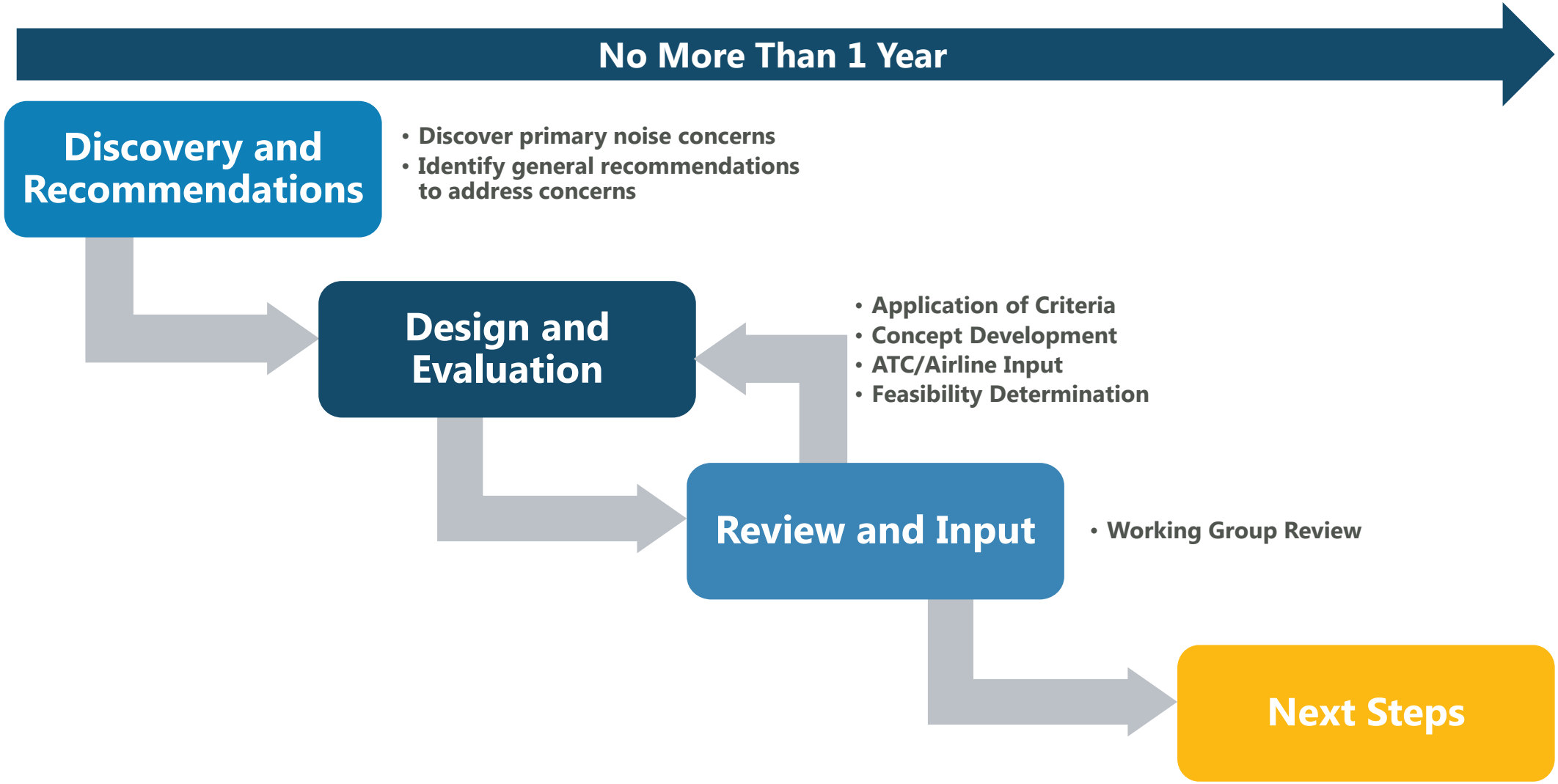
Agenda

- Introductions
- Process Overview Refresher
- Meeting Objective
- Ideas/Suggestions to Address Concerns
- High Level Concept Review
- Next Steps

Introductions

- East County Working Group Facilitator
  - Ms. Heidi Gantwerk
- San Diego County Regional Airport Authority (Airport Authority)
  - Owns and operates the airport
  - Main Contact: Ms. Sjohnna Knack, Program Manager
- Flight Procedure Analysis Consultant Team
  - Project Lead: Mr. Stephen Smith
  - Ricondo & Associates, Inc.
- East County Working Group Members

Process Overview Refresher



SOURCE: : Ricondo and Associates, Inc., November 2018.

Meeting Objective

- Review ideas to address concerns
- Review high-level concepts

Ideas/Suggestions to Address Concerns

Ideas/Suggestions to Address Concerns

- Keep arrivals at 6,000 feet until the NADDO waypoint
- Emphasize use of the current Runway 27 Required Navigation Performance (RNP) Approach
- Design an Area Navigation (RNAV) visual approach that mimics Runway 27 RNP Approach
- Design an RNAV Runway Transition to Runway 27 Final Approach
- Remove flight path between KLOMN and NADDO waypoints

High Level Concept Review

Parameters

- Do not change aircraft flight paths that affect area exposed to CNEL 65 or higher
- Do not impact safety
- Meet FAA design criteria and air traffic control requirements
- Fit within existing airspace
- Do not adversely impact capacity of SDIA
- Do not move noise to new non-compatible areas

Keep Arrivals at 6,000 ft up to NADDO

Fly By Waypoint

- COMIX STAR Route
- 6,000 at NADDO Flight Path
- Runway 27 RNP Approach Route
- Fly By Waypoint

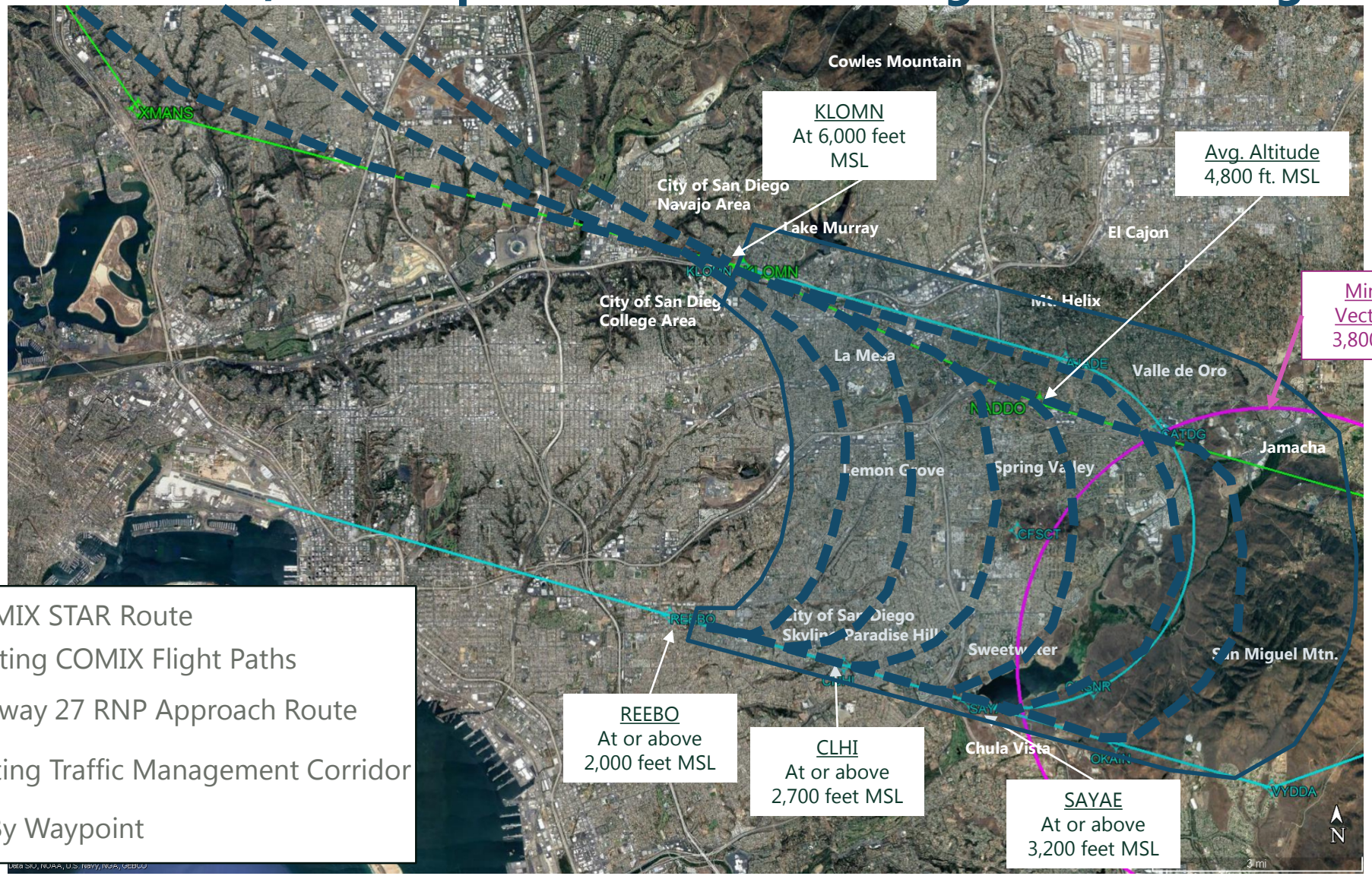
Intent: Reduce noise levels by raising jet arrival altitude

Concept: Keep jet arrival altitude between KLOMN and NADDO waypoints at 6,000 ft. MSL, thence descend to join final approach

Concerns: Limits area for FAA ATC to manage traffic to join the final approach and moves jet traffic closer to arrivals from the east

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (NADDO at 6,000 ft MSL concept).

Keep Arrivals at 6,000 ft up to NADDO – Existing Traffic Management Corridor



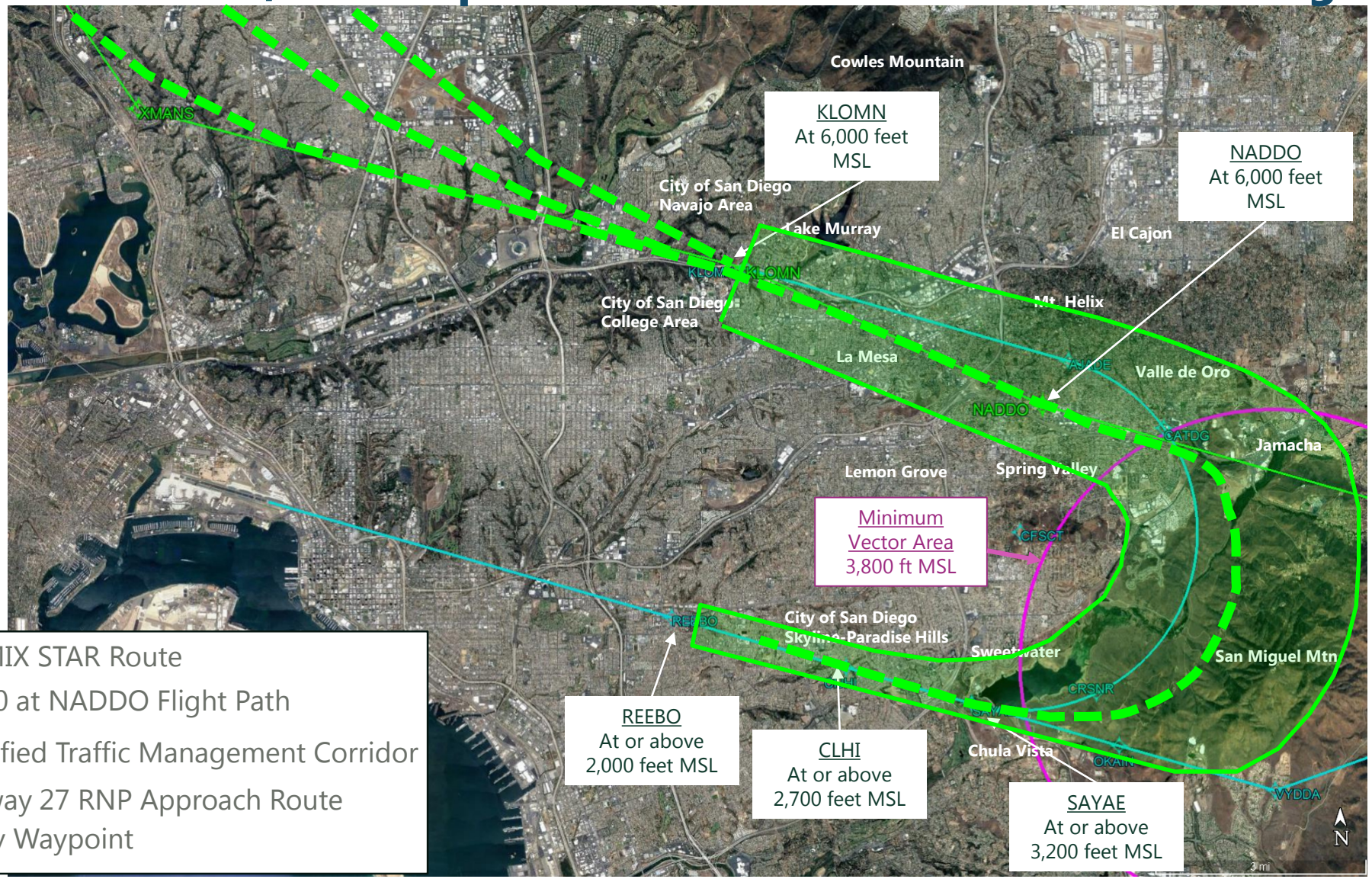
Fly By Waypoint

- COMIX STAR Route
- Existing COMIX Flight Paths
- Runway 27 RNP Approach Route
- Existing Traffic Management Corridor
- Fly By Waypoint

Current width of area where FAA ATC manages traffic to join final approach is approximately 8 nautical miles

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (existing paths and traffic management corridor).

Keep Arrivals at 6,000 ft up to NADDO – Modified Traffic Management Corridor



Fly By Waypoint

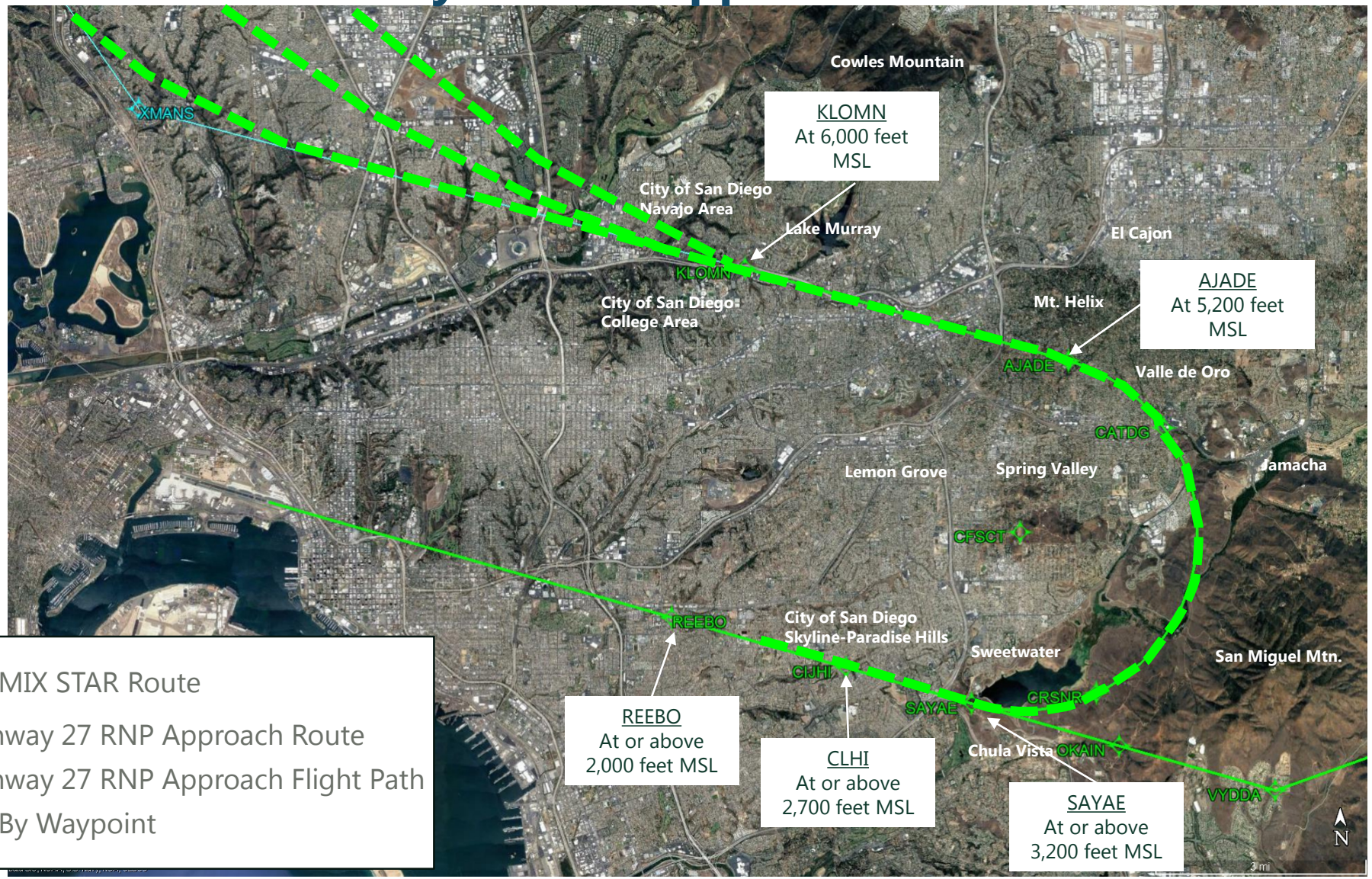
- COMIX STAR Route
- 6,000 at NADDO Flight Path
- Modified Traffic Management Corridor
- Runway 27 RNP Approach Route
- Fly By Waypoint

Concept would require aircraft to proceed further east after NADDO waypoint to get the necessary flight path distance needed to descend and slow down prior to joining the final approach.

Width of area where FAA ATC could manage traffic to join final approach may reduce from 8 to approximately 3 nautical miles. The limited area to manage traffic may be considered infeasible by FAA

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (f6,000 ft. at NADDO flight path; modified traffic management corridor).

Emphasize Use of Runway 27 RNP Approach



Fly By Waypoint

- COMIX STAR Route
- Runway 27 RNP Approach Route
- Runway 27 RNP Approach Flight Path
- Fly By Waypoint

Intent: Reduce noise levels by locating arrivals over more compatible areas

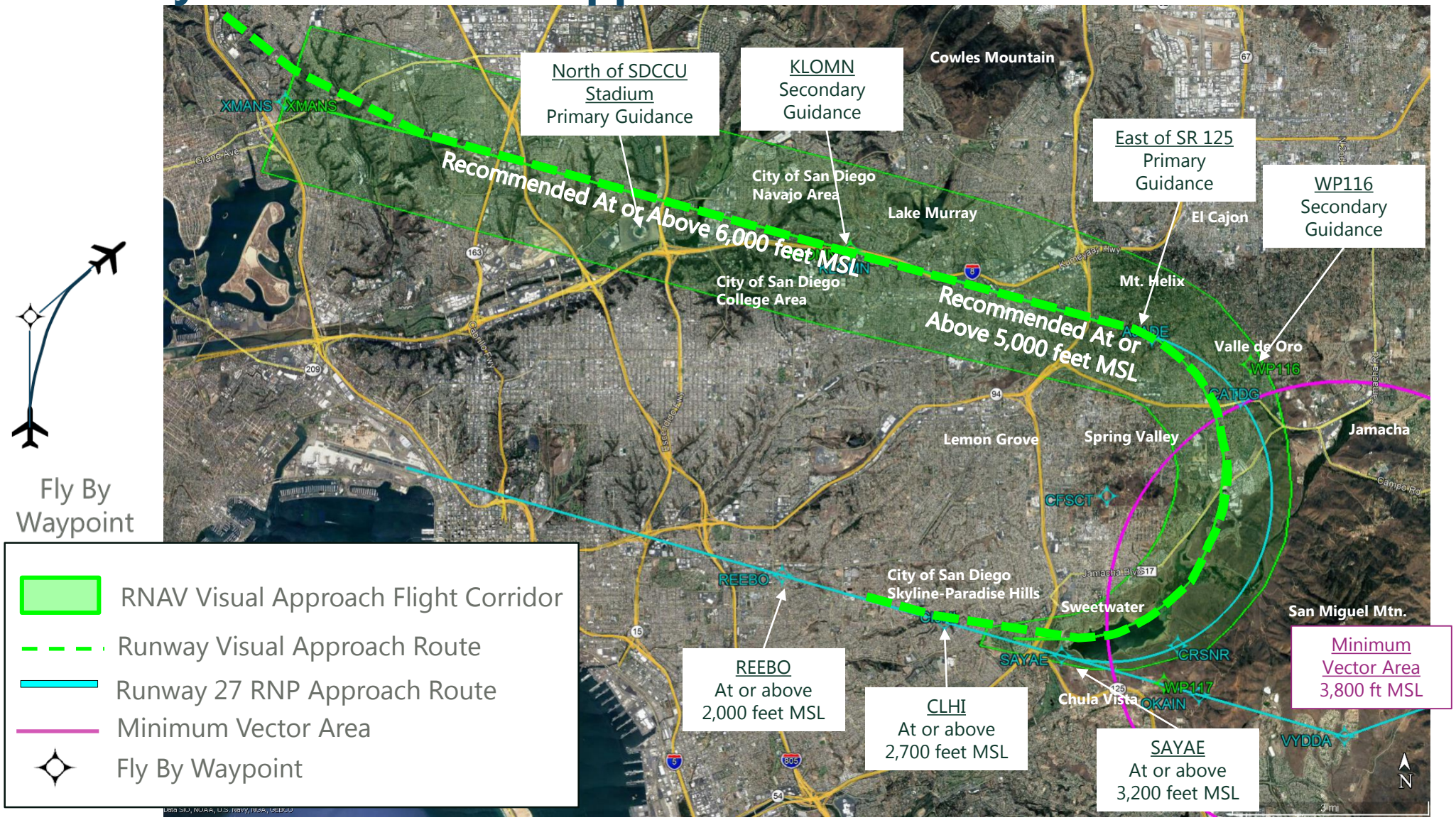
Concept: Emphasize increased use of the Runway 27 RNP approach

Concerns: RNP approach is limited to aircraft with required equipment and pilots authorized to fly the approach

Would concentrate more arrivals over areas underneath the RNP flight path

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (RNP approach flight path).

Runway 27 RNAV Visual Approach



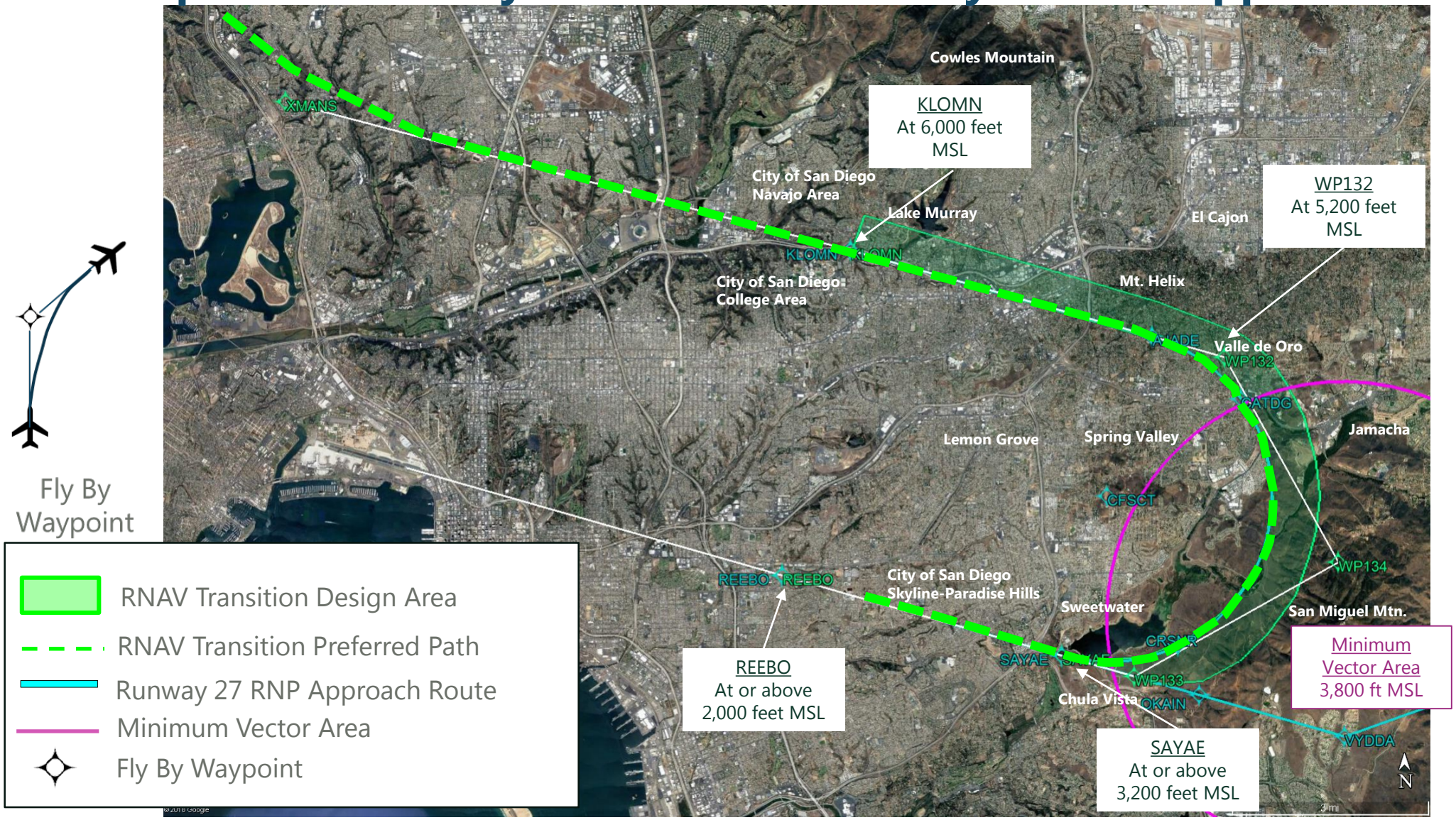
Intent: Reduce noise levels by locating arrivals over more compatible areas with some dispersion

Concept: Keep jet arrivals a visual approach along an eastbound path at RNP approach altitudes and turn south over more compatible area

Concerns: Requires pilots to request approach and FAA may not be able to accommodate visual approach during peak arrival demand periods

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (RNAV Visual approach concept route and corridor).

Develop RNAV Runway Transition to Runway 27 Final Approach



Intent: Reduce noise levels by locating arrivals over more compatible areas

Concept: Provide RNAV runway transition that mimics Runway 27 RNP approach and does not require additional navigation equipment and pilot authorization

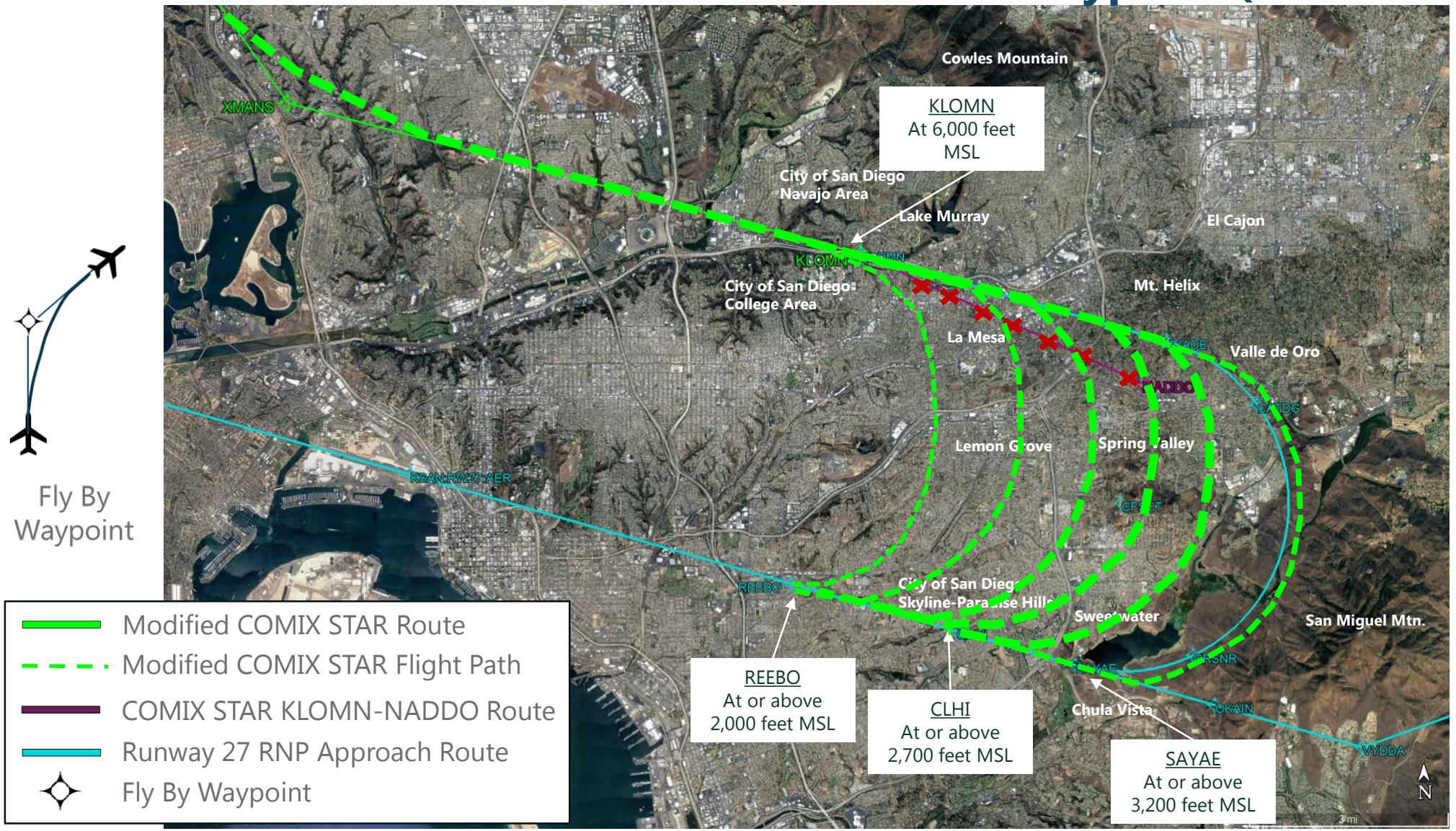
Concerns: May not be able to meet terrain and obstruction clearance requirements

May include aircraft performance concerns by users.

Would concentrate more arrivals over areas underneath the proposed flight path

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (Runway 27 RNP Approach route; Minimum Vector Area): Ricondo & Associates, Inc., April 2019 (RNAV Runway Transition concept flight path).

Remove Route Between KLOMN and NADDO Waypoint (after Class B Change)



Fly By Waypoint

- Modified COMIX STAR Route
- Modified COMIX STAR Flight Path
- COMIX STAR KLOMN-NADDO Route
- Runway 27 RNP Approach Route
- Fly By Waypoint

Intent: Reduce noise by increasing dispersion as aircraft turn south to join the final approach

Concept: Discontinue use of the route between the KLOMN and NADDO waypoints and keep jet arrivals on an easterly heading until directed to turn south to join final approach

Concerns: The KLOMN to NADDO route was designed to provide pilots a predictable route that will keep the aircraft in the Class B airspace. FAA may require the proposed Class B airspace be implemented prior to removing the KLOMN to NADDO route.

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (modified COMIX STAR concept and flight path).

Next Steps

Next Steps

- Conduct design on potentially feasible concepts
- Meet with FAA Southern California Terminal Radar Approach Control to gather feedback on concepts
- Review findings with Working Group

RICONDO®

San Diego International Airport
East County Working Group - Aircraft Noise Concerns

Meeting #4

PRESENTED TO:
SDIA East County Working Group

PRESENTED BY:
Stephen C. Smith

PRESENTED ON:
July 25, 2019

Agenda

- Introductions
- Meeting Objective
- ECWG Airline Pilot Comments and Concept
- Extended Approach Design Review
- Draft Design Concepts
- Eliminated Design Concepts
- Next Steps

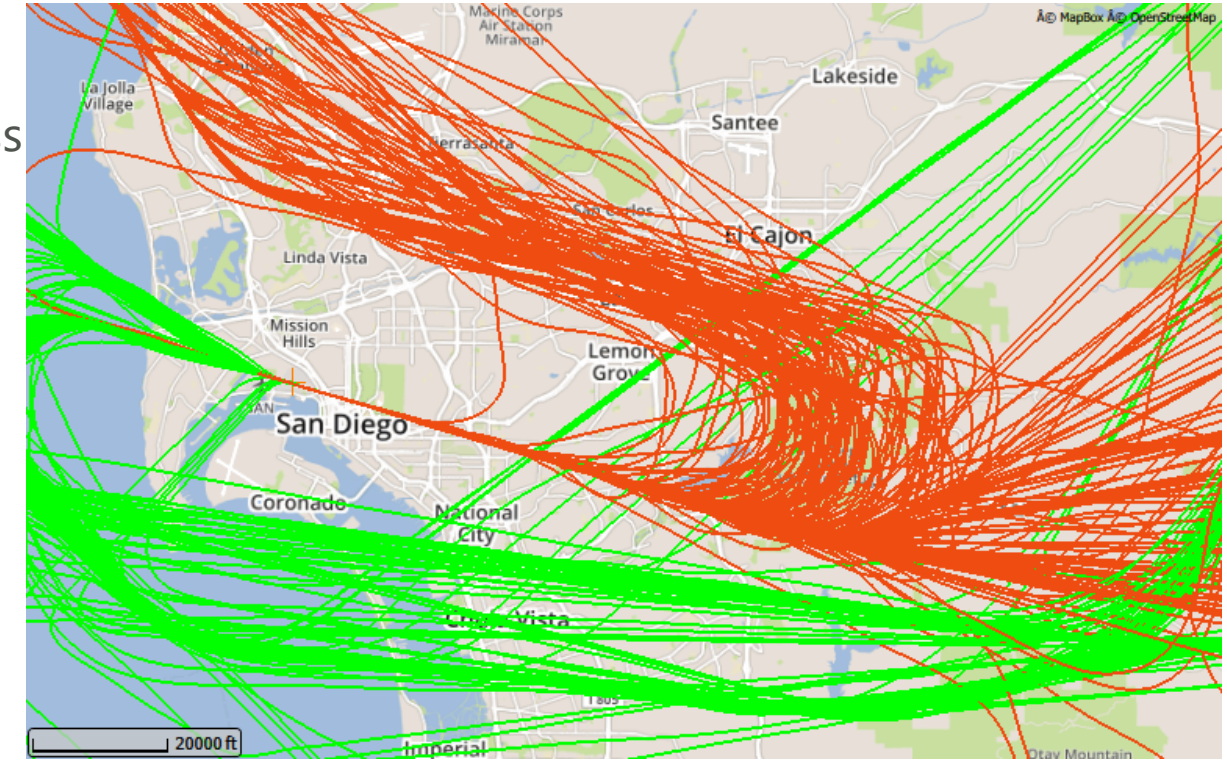
Meeting Objective

- Review ECWG proposed design concepts
- Review extended approach design results
- Review draft design concepts based on ECWG feedback

ECWG Airline Pilot Member Comment and Concept

ECWG Airline Pilot Member Comments

- Desirable traits of north arrival operations:
  - Track dispersion
  - Higher altitude on downwind over populated areas
  - Turn south to join final approach (crosswind) over less populated areas.
- Limitations include:
  - Airspace limits
  - Controller flexibility to merge north arrivals with east arrivals
  - Commercial airliner operational limitations.



SOURCE: San Diego County Regional Airport Authority, July 2019 (Airport Noise and Operations Monitoring System track data for June 27, 2019).

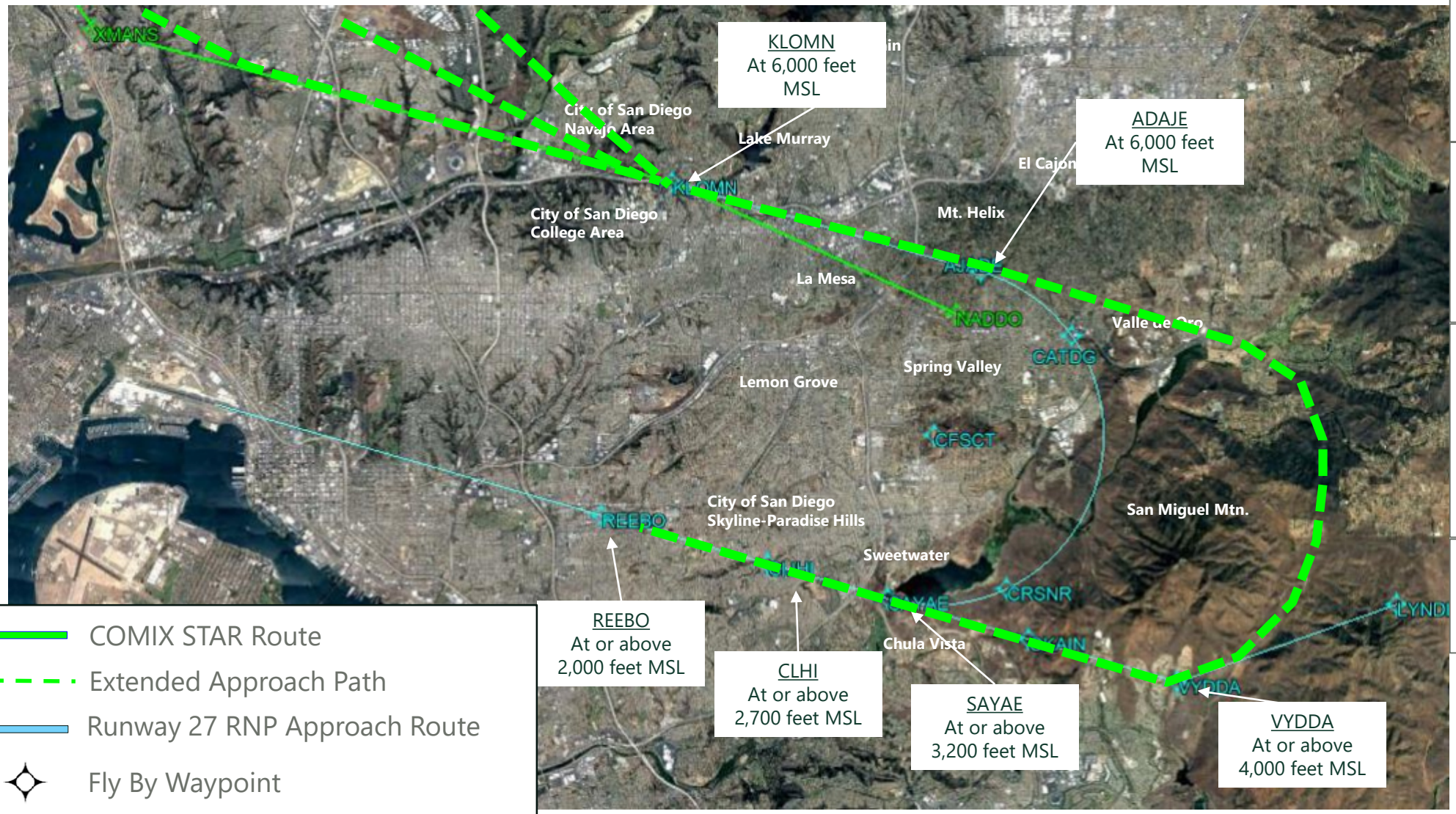
ECWG Airline Pilot Member Comments (continued)

- All major operators routinely fly RNAV/VNAV arrivals to an approaches throughout the US and the world - it reduces the workload for the cockpit crew
- Visual approach is not preferred for most pilots:
  - Requires pilot responsibility of traffic separation, terrain clearance and staying within the confines of the Class B airspace while calculating how best to get on the proper descent profile.
  - Visual approaches are notorious for unstable approaches
  - RNAVs are often easier than visuals

ECWG Airline Pilot Member Proposed Concept

- Combination of three arrival concepts used based on demand
- Provide greater arrival track dispersion and an overall reduction in aircraft noise exposure

Extended RNAV Approach from KLOMN to VYDDA (Low Demand Period)



Intent: Reduce noise levels by raising jet arrival altitude and moving traffic further east

Concept: Keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence follow RNAV approach further east

Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: No
3. Turn South Over Less Populated Areas: Yes

Potential Limitations: May not be applicable when demand levels are high

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., July 2019 (proposed extended approach path).

Keep Arrivals at 6,000 ft up to KLOMN (Medium to Low Demand Periods)

COMIX STAR Route

6,000 at NADDO Flight Path

Runway 27 RNP Approach Route

Fly By Waypoint

Intent: Reduce noise levels by raising jet arrival altitude and prevent closer turns to airport

Concept: Keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence descend to join final approach

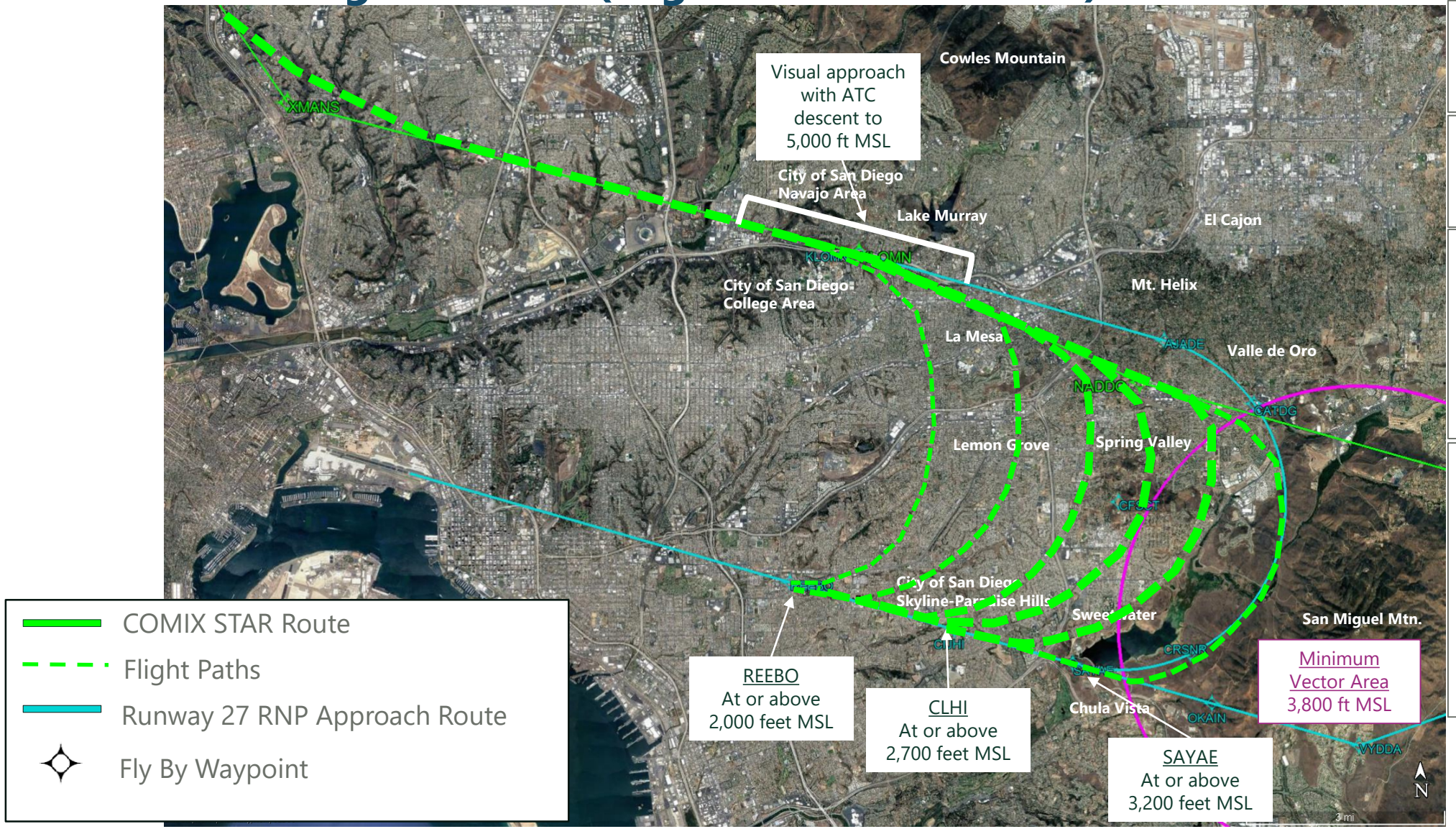
Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: Yes
3. Turn South Over Less Populated Areas: No

Potential Limitations:
Limits area for FAA ATC to manage traffic to join the final approach.

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground

SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (NADDO at 6,000 ft MSL concept)

FAA ATC Managed Arrival (High Demand Periods)



Intent: Maintain dispersion as aircraft turn south to join the final approach

Concept: Maintain dispersion procedures when air traffic demand is high

Objectives:
1. Raise Altitude on Downwind: No
2. Maintain Dispersion: Yes
3. Turn South Over Less Populated Areas: No

Potential Limitations: No limitations. Represents existing ATC operating procedures. Does not address current noise concerns, but maintains FAA ability to efficiently manage traffic

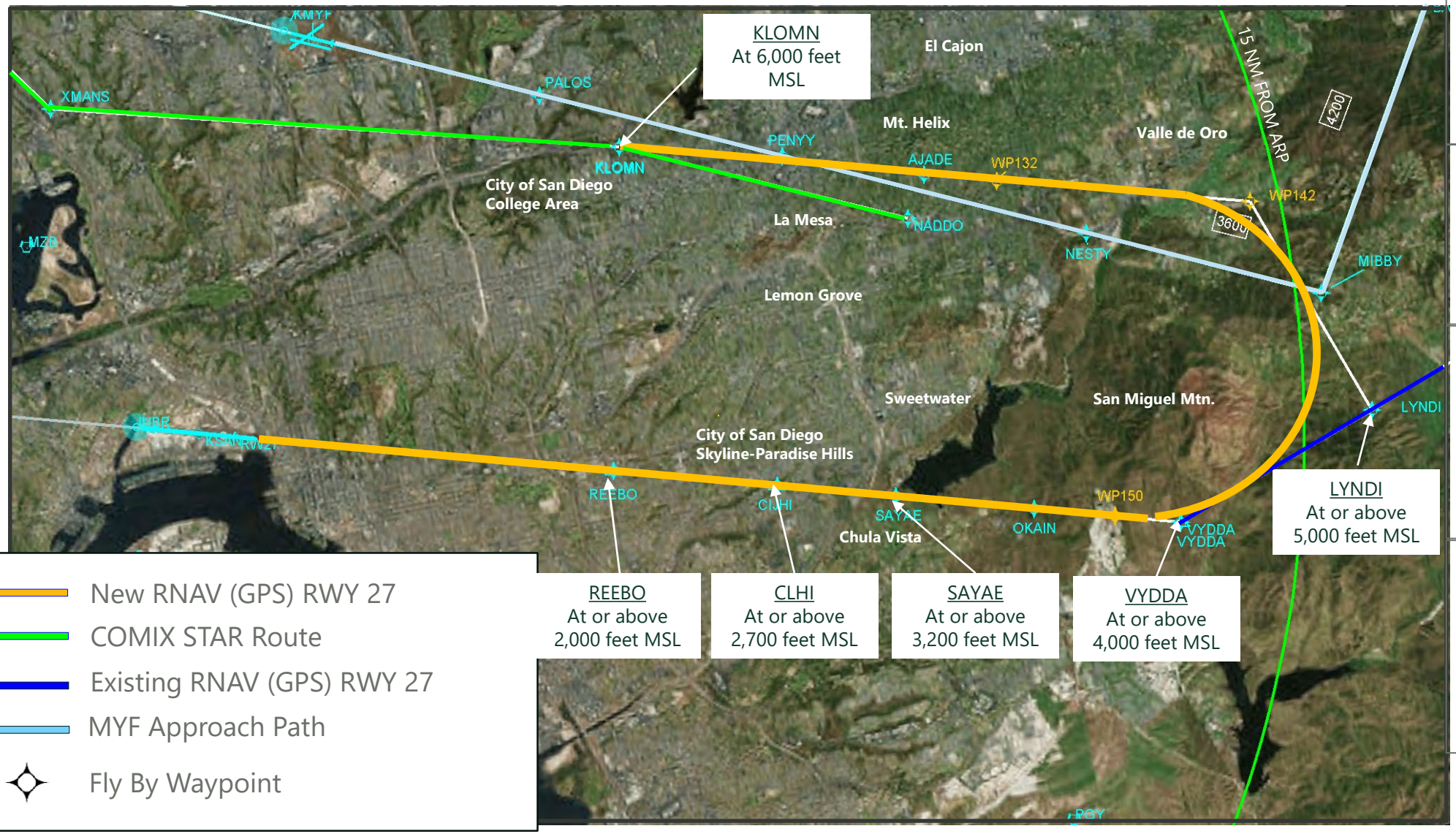
NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (modified COMIX STAR concept and flight path).

Extended RNAV Approach from KLOMN to VYDDA Design

ECWG Extended RNAV Approach Design

- Started with proposed concept to join final approach at VYDDA:
  - Considered terrain and obstructions
  - Considered maintaining descent to avoid level segments
  - Considered other published procedures
- If not feasible, consider modified concept to join final at modified waypoint

Extended RNAV Approach from KLOMN – Iteration 1



KLOMN
At 6,000 feet MSL

LYNDI
At or above 5,000 feet MSL

REEBO
At or above 2,000 feet MSL

CLHI
At or above 2,700 feet MSL

SAYAE
At or above 3,200 feet MSL

VYDDA
At or above 4,000 feet MSL

- New RNAV (GPS) RWY 27
- COMIX STAR Route
- Existing RNAV (GPS) RWY 27
- MYF Approach Path
- Fly By Waypoint

Intent: Reduce noise levels by raising jet arrival altitude and moving traffic further east

Concept: Keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence follow RNAV approach further east

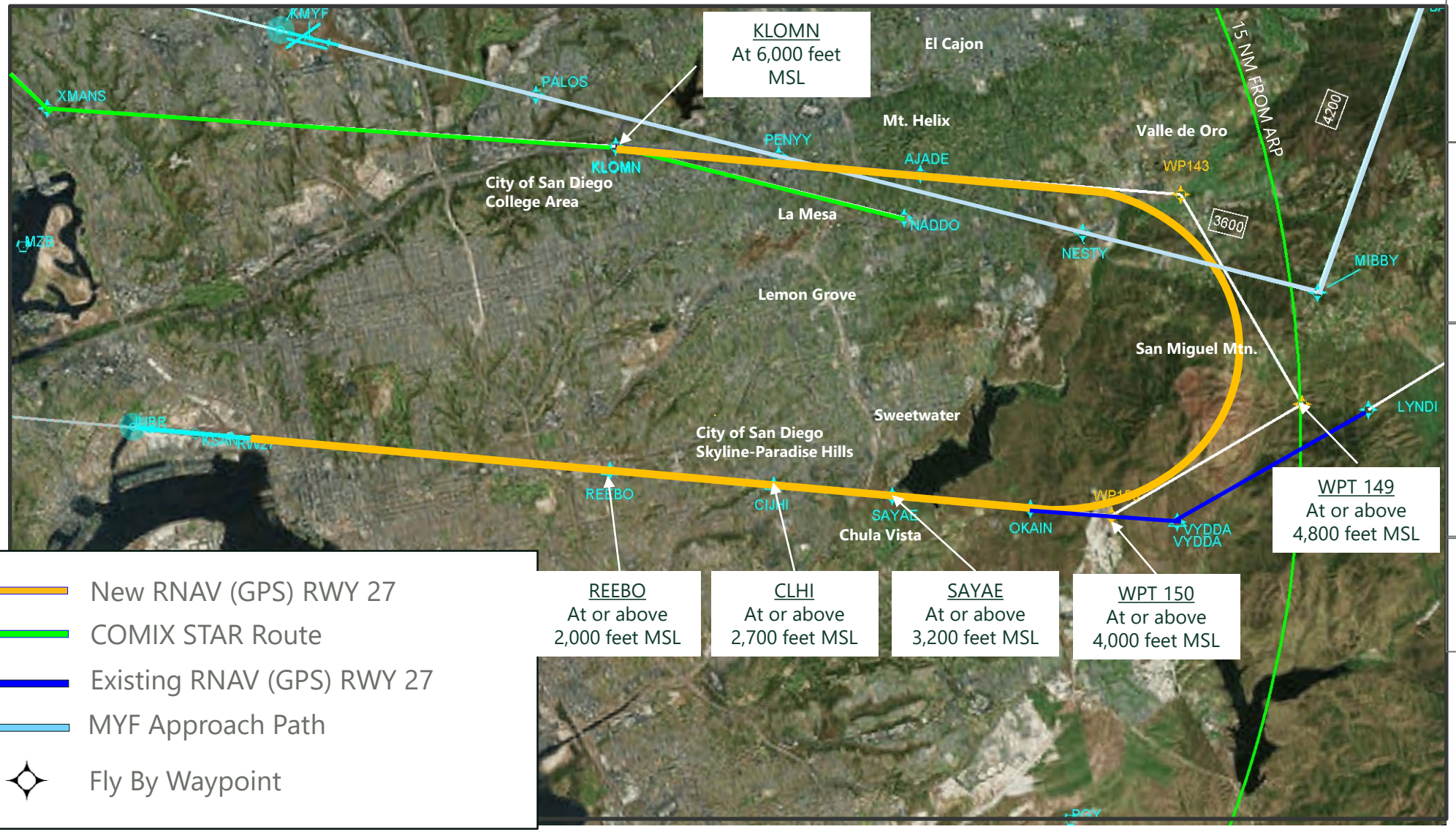
Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: No
3. Turn South Over Less Populated Areas: Yes

Limitations: Conflict with Montgomery Field approach and LYNDI STAR. Requires waiver to allow for a longer intermediate segment.

Extended RNAV Approach from KLOMN to VYDDA – Iteration 1 Notes

- Procedure ties into existing RNAV (GPS) Y RWY 27 Approach
  - Converging at LYNDI
  - Allows for a stable transition into the final straight segment
- Requires waiver
  - Intermediate Segment is longer than 15 NM and is beyond 15 NM from the Airport Reference Point (ARP)
  - Several adjustments (i.e., speed) were attempted but all would require a waiver
- Increases ATC complexity
  - Conflicts with Montgomery Airport approach to Runway 28L
  - Conflicts with LYNDI RNAV STAR
- Increased flight miles versus RNAV (GPS) Z RWY 27
- **Design is not feasible due to waiver requirement**

Extended RNAV Approach from KLOMN – Iteration 2



Intent: Reduce noise levels by raising jet arrival altitude and moving traffic further east

Concept: Keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence follow RNAV approach further east

Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: No
3. Turn South Over Less Populated Areas: Yes

Limitations: Conflict with Montgomery Field approach and LYNDI STAR.

Extended RNAV Approach from KLOMN to New Waypoint – Iteration 2 Notes

- Procedure intercepts existing RNAV (GPS) RWY 27 **east of VYDDA**
- No waivers required
- Increased ATC complexity
  - Conflicts with Montgomery Airport approach to Runway 28L
  - Conflicts with LYNDI RNAV STAR
  - Creates a new approach route to Runway 27
- Increased flight miles versus RNAV (GPS) Z RWY 27
- **Primary concern is increased complexity added to ATC**

Consultant Recommendations

- Concerns
  - Likelihood of FAA approval – low
    - Additional complexity related to procedure conflicts
    - Increase in flight distance may encounter user concerns during FAA RNAV process

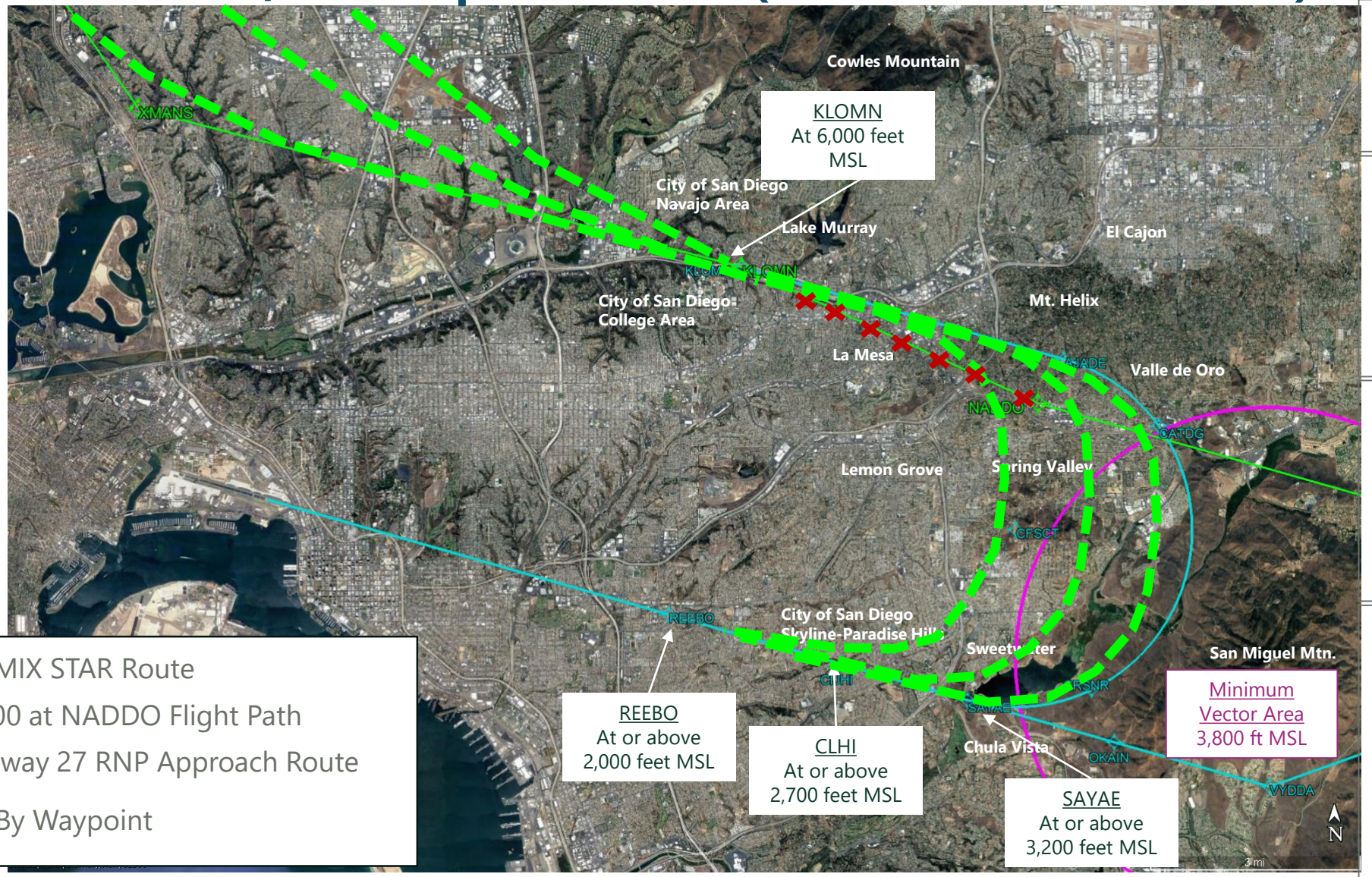
Note: Need to discuss design and potential complexity with FAA to confirm

Draft Design Concepts

Draft Concept Overview

- A single draft concept is proposed – made of multiple procedures based on when FAA can accommodate
- Includes two existing procedures (Runway 27 RNP Approach and ATC Radar and Visual Approach)
- One design concept involves a new RNAV approach procedure and one that involves a modification to the existing COMIX RNAV STAR
- Procedure concepts are intended to be used when possible during a given day based on demand – provides opportunities for dispersion, higher altitudes on the downwind path and turning south over more compatible areas when able.
- Procedures will not prohibit FAA ATC from re-directing flight.
- Will require encouragement to increase use of procedures.

Keep Arrivals at 6,000 ft up to KLOMN (Remove NADDO Route)



COMIX STAR Route

6,000 at NADDO Flight Path

Runway 27 RNP Approach Route

Fly By Waypoint

Intent: Reduce noise levels by raising jet arrival altitude and prevent closer turns to airport

Concept: Remove route to NADDO and keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence descend to join final approach

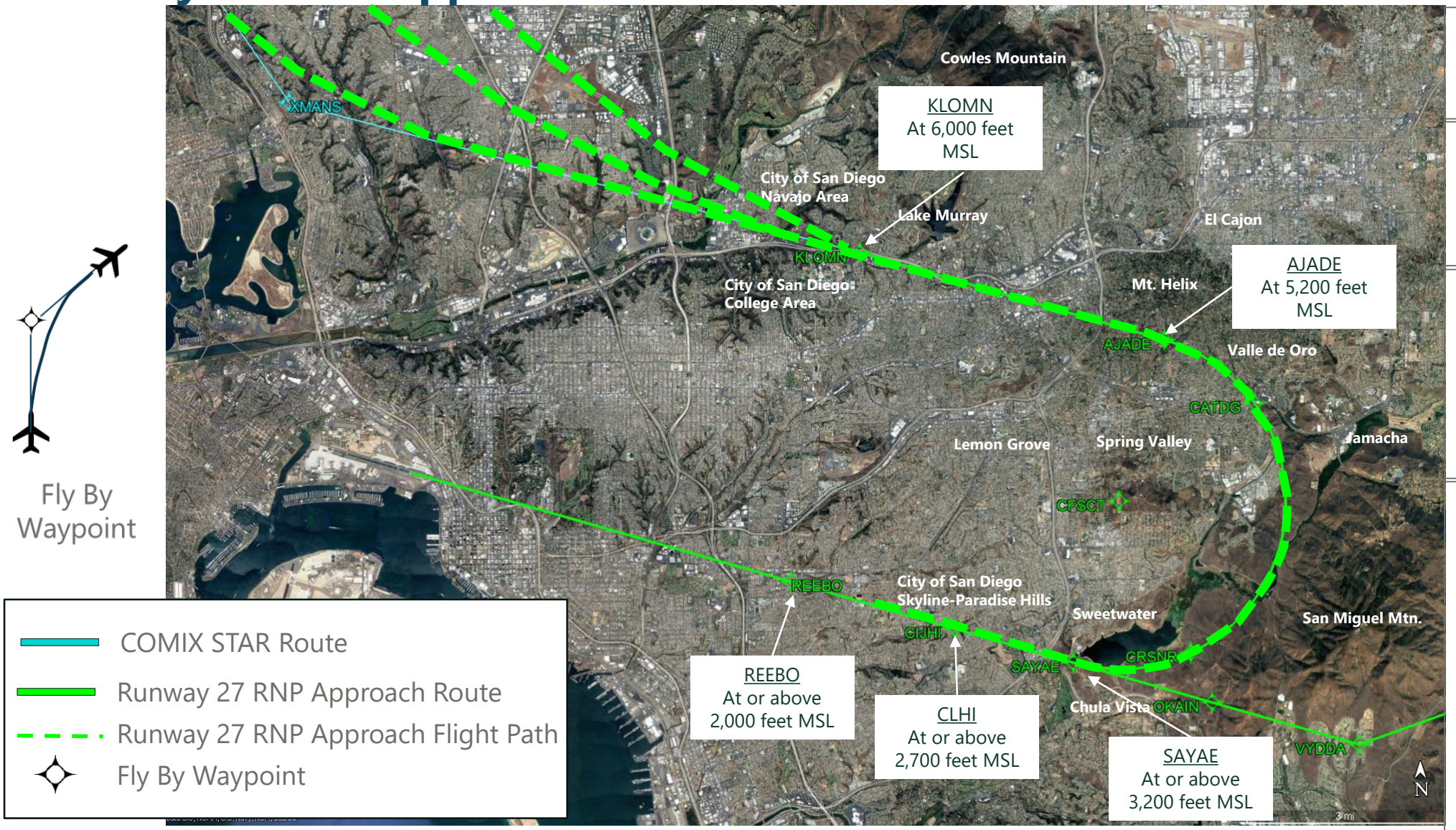
Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: Yes
3. Turn South Over Less Populated Areas: No

Potential Limitations:
Limits area for FAA ATC to manage traffic to join the final approach. FAA may require the proposed Class B airspace be implemented prior to removing the KLOMN to NADDO route

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground

SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (NADDO at 6,000 ft MSL concept).

Runway 27 RNP Approach



Fly By Waypoint

- COMIX STAR Route
- Runway 27 RNP Approach Route
- Runway 27 RNP Approach Flight Path
- Fly By Waypoint

Intent: Reduce noise levels by locating arrivals over more compatible areas

Concept: Emphasize use of the Runway 27 RNP approach over ATC directed visual approach

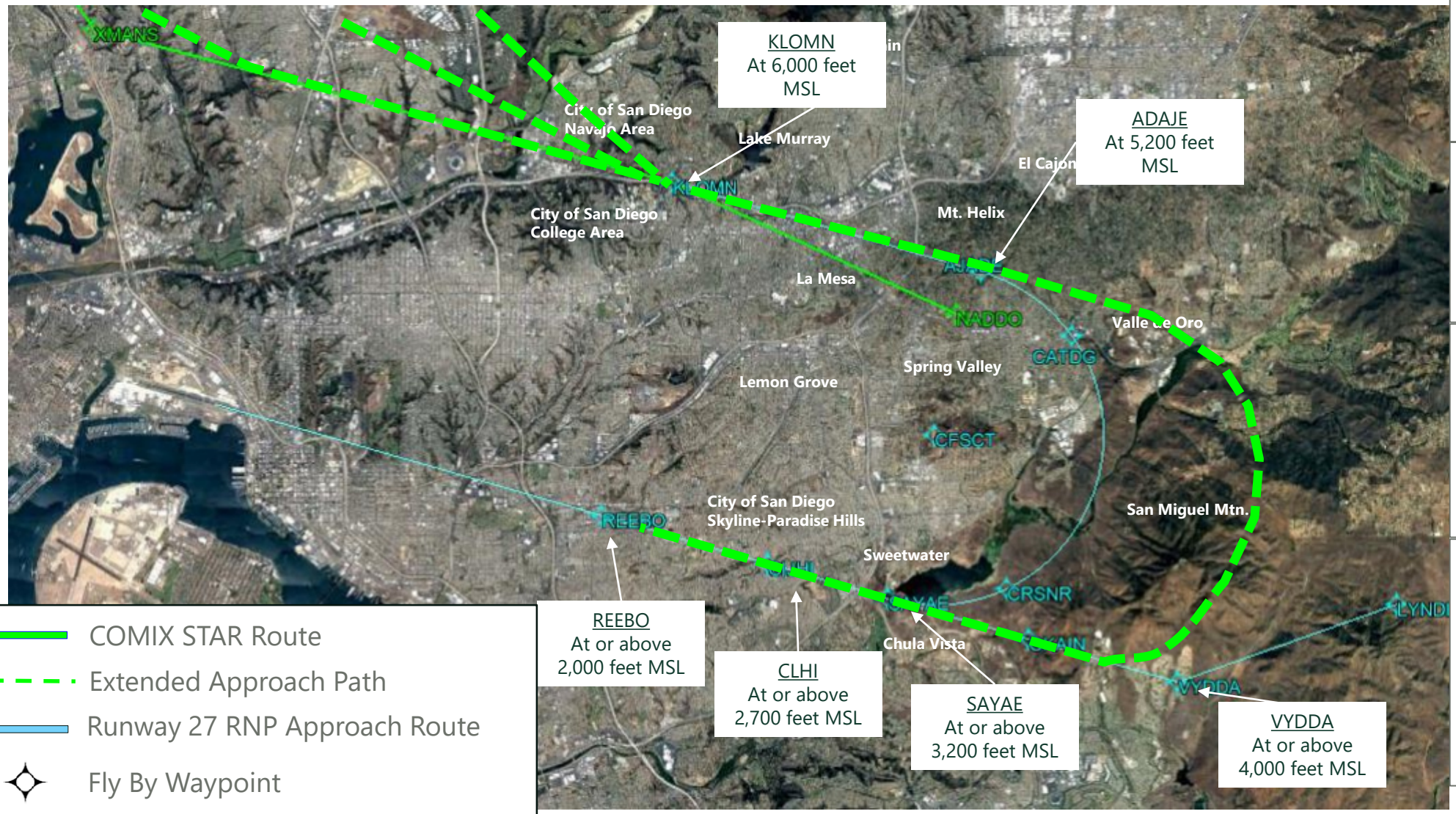
Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: No
3. Turn South Over Less Populated Areas: Yes

Potential Limitations: RNP approach is limited to aircraft with required equipment and pilots authorized to fly the approach.

Would concentrate more arrivals over areas underneath the RNP flight path

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (RNP approach flight path).

Extended RNAV Approach from KLOMN to Waypoint Close to VYDDA



Intent: Reduce noise levels by raising jet arrival altitude and moving traffic further east

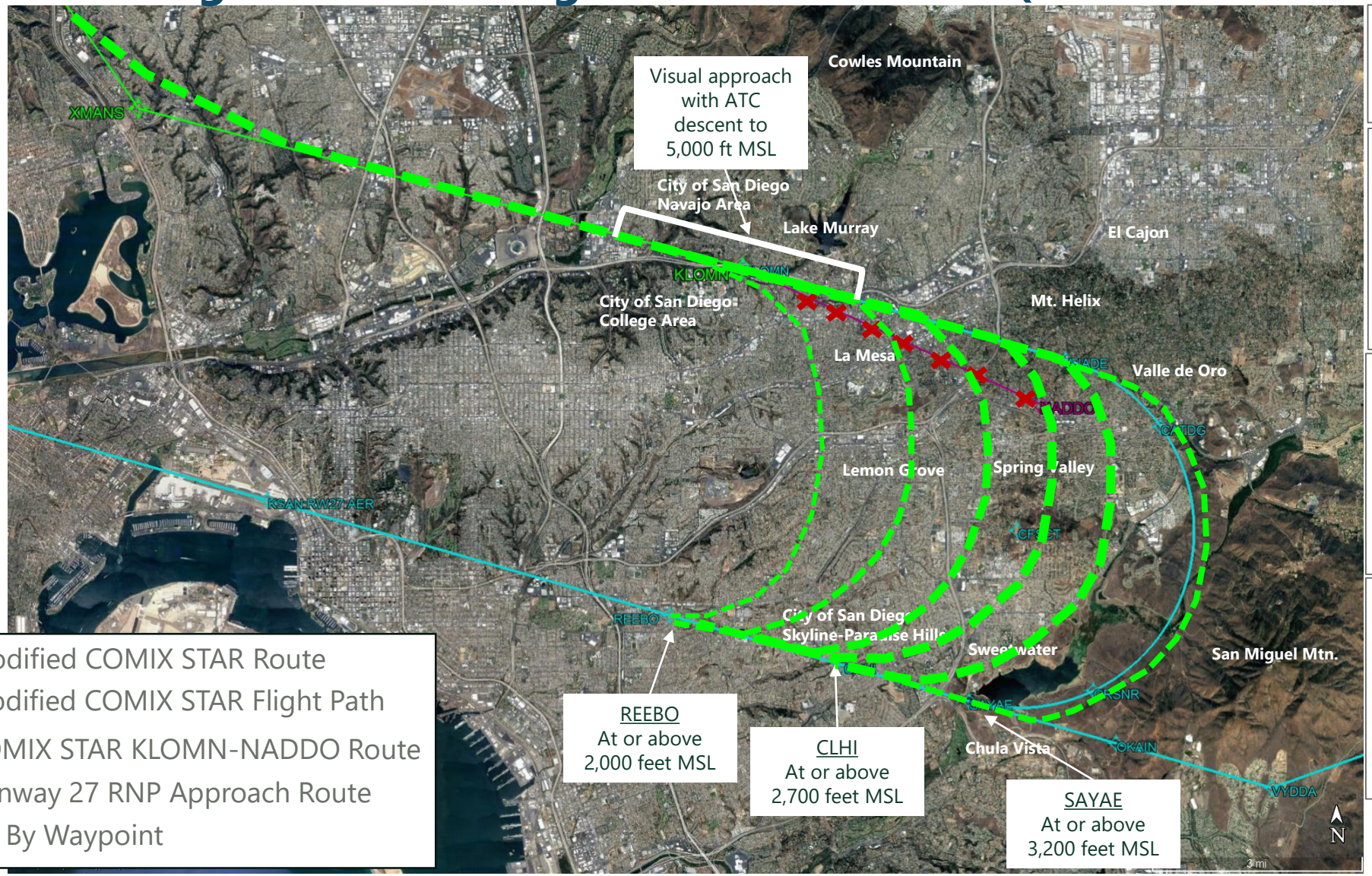
Concept: Keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence follow RNAV approach further east

Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: No
3. Turn South Over Less Populated Areas: Yes

Potential Limitations:
Adds complexity to ATC and increases distance. May be applicable when demand levels are low during nighttime hours (11pm to 6am).

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., July 2019 (proposed extended approach path).

FAA ATC Managed Arrival – High Demand Periods (Remove NADDO Route)



Modified COMIX STAR Route
Modified COMIX STAR Flight Path
COMIX STAR KLOMN-NADDO Route
Runway 27 RNP Approach Route
Fly By Waypoint

REEBO
At or above 2,000 feet MSL

CLHI
At or above 2,700 feet MSL

SAYAE
At or above 3,200 feet MSL

Intent: Maintain dispersion as aircraft turn south to join the final approach

Concept: Discontinue use of the route between the KLOMN and NADDO waypoints and maintain dispersion procedures when air traffic demand is high

Objectives:
1. Raise Altitude on Downwind: No
2. Maintain Dispersion: Yes
3. Turn South Over Less Populated Areas: No

Potential Limitations: FAA may require the proposed Class B airspace be implemented prior to removing the KLOMN to NADDO route

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (modified COMIX STAR concept and flight path).

Eliminated Design Concepts

Keep Arrivals at 6,000 ft up to NADDO

Fly By Waypoint

- COMIX STAR Route
- 6,000 at NADDO Flight Path
- Runway 27 RNP Approach Route
- Fly By Waypoint

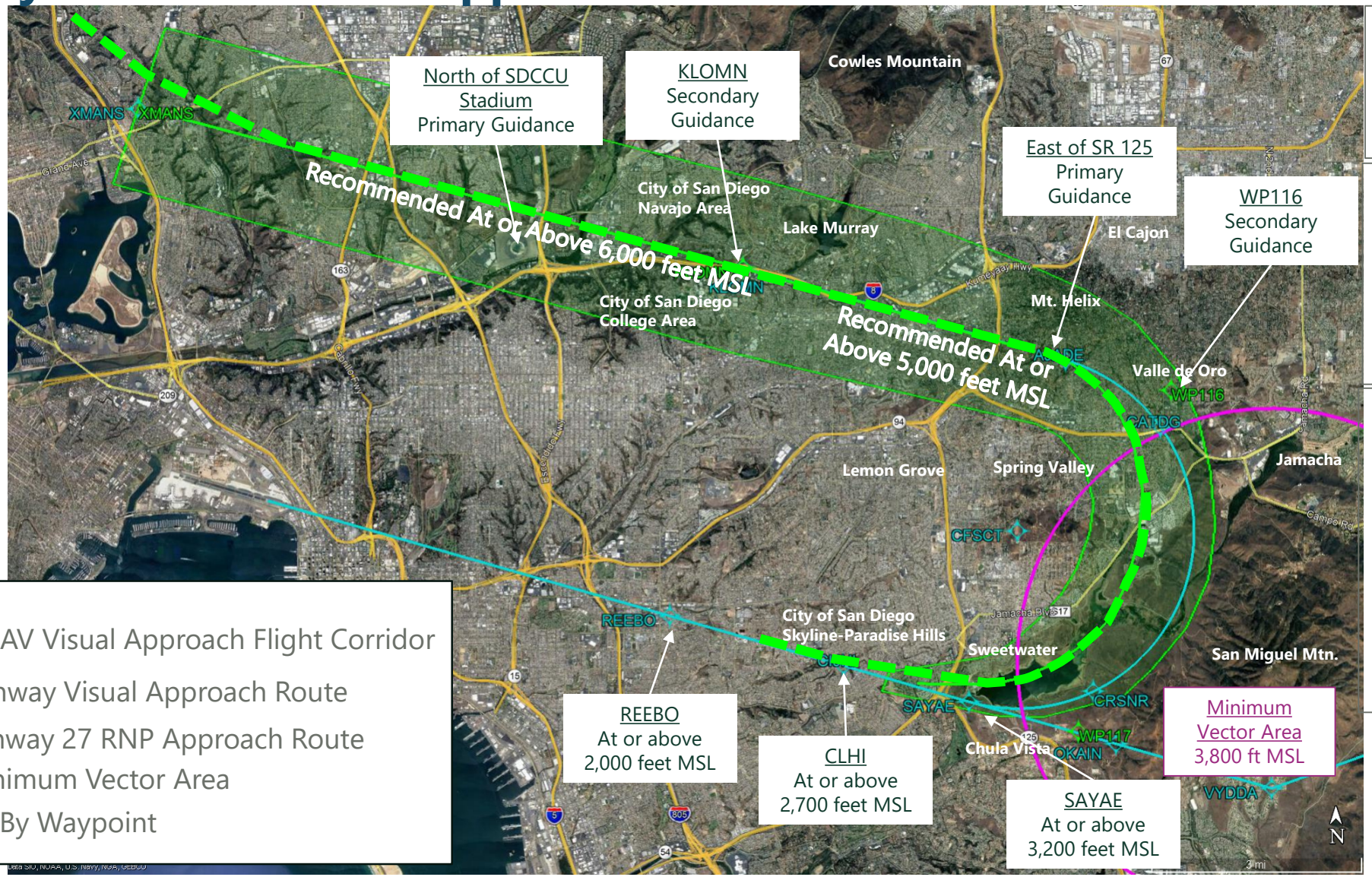
Intent: Reduce noise levels by raising jet arrival altitude

Concept: Keep jet arrival altitude between KLOMN and NADDO waypoints at 6,000 ft. MSL, thence descend to join final approach

Eliminated: Preference is to remove route between KLOMN and NADDO; therefore, a design concept maintaining NADDO waypoint is no longer considered. Would also reduce area for ATC to manage and merge arrivals with traffic from the east. Terrain would also limit ATC ability to efficiently manage traffic.

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (NADDO at 6,000 ft MSL concept).

Runway 27 RNAV Visual Approach



Fly By Waypoint

- RNAV Visual Approach Flight Corridor
- Runway Visual Approach Route
- Runway 27 RNP Approach Route
- Minimum Vector Area
- Fly By Waypoint

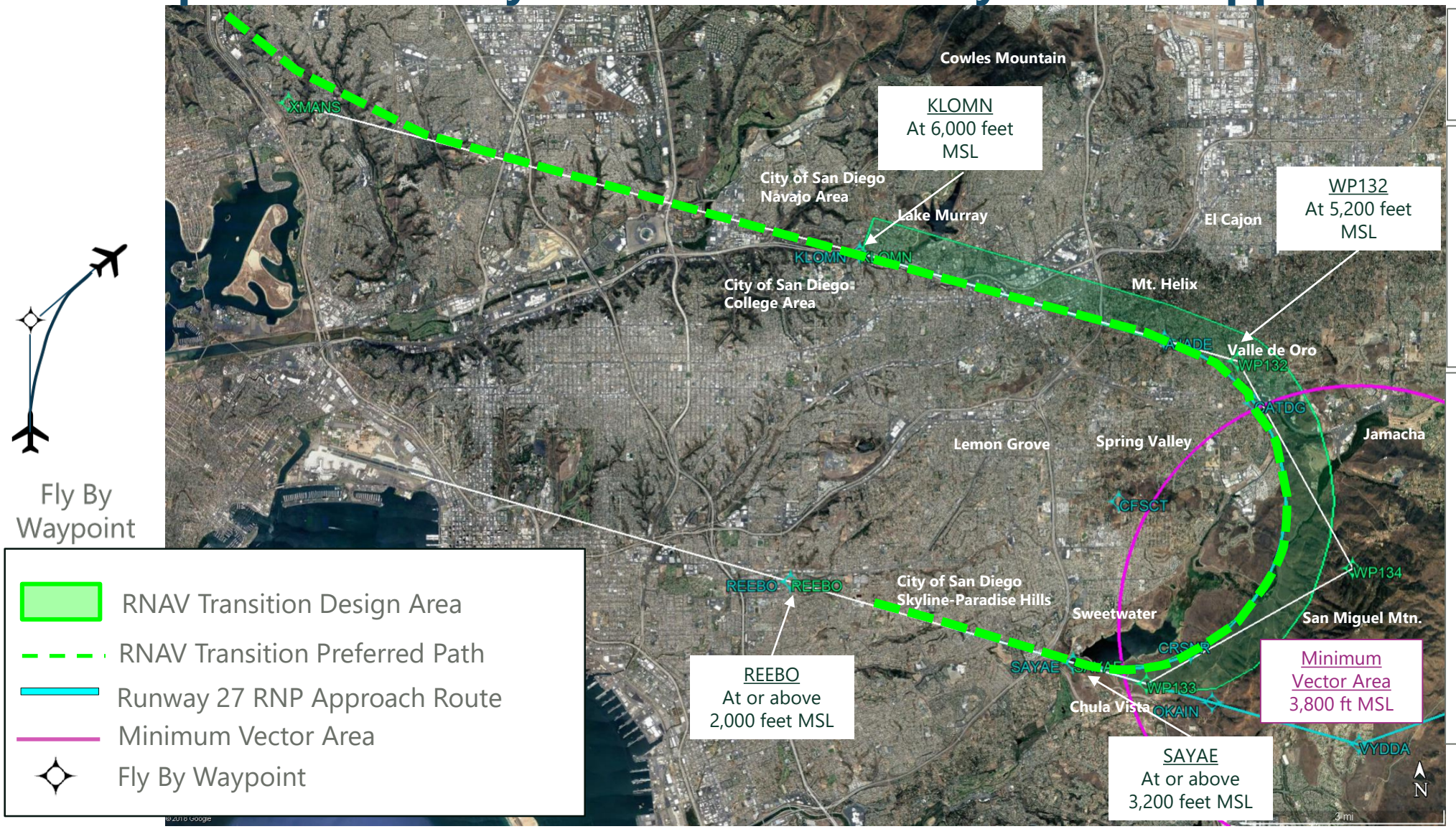
Intent: Reduce noise levels by locating arrivals over more compatible areas with some dispersion

Concept: Keep jet arrivals a visual approach along an eastbound path at RNP approach altitudes and turn south over more compatible area

Eliminated: Based on input from the ECWG airline pilot member, the likelihood that the visual approach would be requested over an RNAV approach is very low due to increased workload and increased possibility for an unstable approach.

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (RNAV Visual approach concept route and corridor).

Develop RNAV Runway Transition to Runway 27 Final Approach



Fly By Waypoint

- RNAV Transition Design Area
- RNAV Transition Preferred Path
- Runway 27 RNP Approach Route
- Minimum Vector Area
- Fly By Waypoint

Intent: Reduce noise levels by locating arrivals over more compatible areas

Concept: Provide RNAV runway transition that mimics Runway 27 RNP approach and does not require additional navigation equipment and pilot authorization

Eliminated: An RNP approach is currently published and implementing an RNAV approach over same area may increase more frequent concentration, which conflicts with ECWG's objective to maintain as much dispersion as possible.

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (Runway 27 RNP Approach route; Minimum Vector Area): Ricondo & Associates, Inc., April 2019 (RNAV Runway Transition concept flight path).

Next Steps

Next Steps

- Meet with FAA SCT TRACON to discuss extended approach and the feasibility of managing arrivals differently based on demand
- Refine design concepts as necessary
- Conduct noise screening analysis on design concepts
- Review final design concepts and noise screening results with ECWG

RICONDO®

San Diego International Airport
East County Working Group - Aircraft Noise Concerns

Meeting #5

PRESENTED TO:
SDIA East County Working Group

PRESENTED BY:
Stephen C. Smith

PRESENTED ON:
December 11, 2019

Agenda

- Introductions
- Meeting Objective
- Final Design Concepts
- Noise Modeling Screening Results
- Recommendations
- Next Steps

Meeting Objective

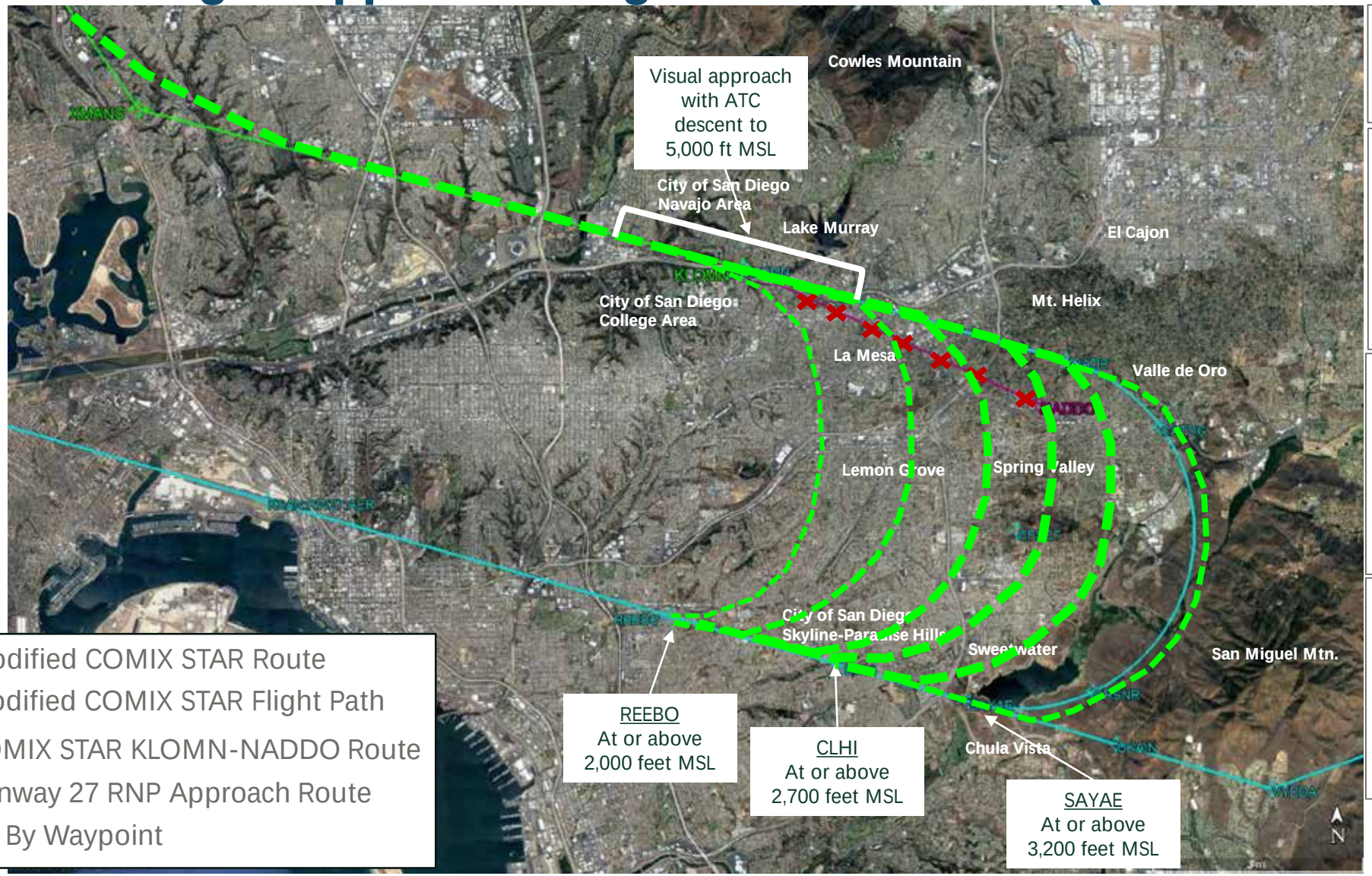
- Review final design concepts
- Review aircraft noise model screening results
- Discuss recommendations

Final Design Concepts

Final Concept Overview

- A single draft concept is proposed – made of multiple procedures based on when FAA can accommodate
- Includes two existing procedures: Runway 27 RNP Approach and FAA ATC Managed Approach
- Modification of one existing procedure: COMIX RNAV STAR
- New RNAV approach procedure: Runway 27 RNAV approach during late night period
- Intent: procedure concepts are intended to be used when possible during a given day based on demand – provides opportunities for dispersion, higher altitudes on the downwind path and turning south over more compatible areas when able.
- Note:
  - Procedures will not prohibit FAA ATC from re-directing flight.
  - Will require encouragement to increase use of procedures.

FAA ATC Managed Approach – High Demand Periods (Remove NADDO Route)



Modified COMIX STAR Route
Modified COMIX STAR Flight Path
COMIX STAR KLOMN-NADDO Route
Runway 27 RNP Approach Route
Fly By Waypoint

Intent: Maintain dispersion as aircraft turn south to join the final approach

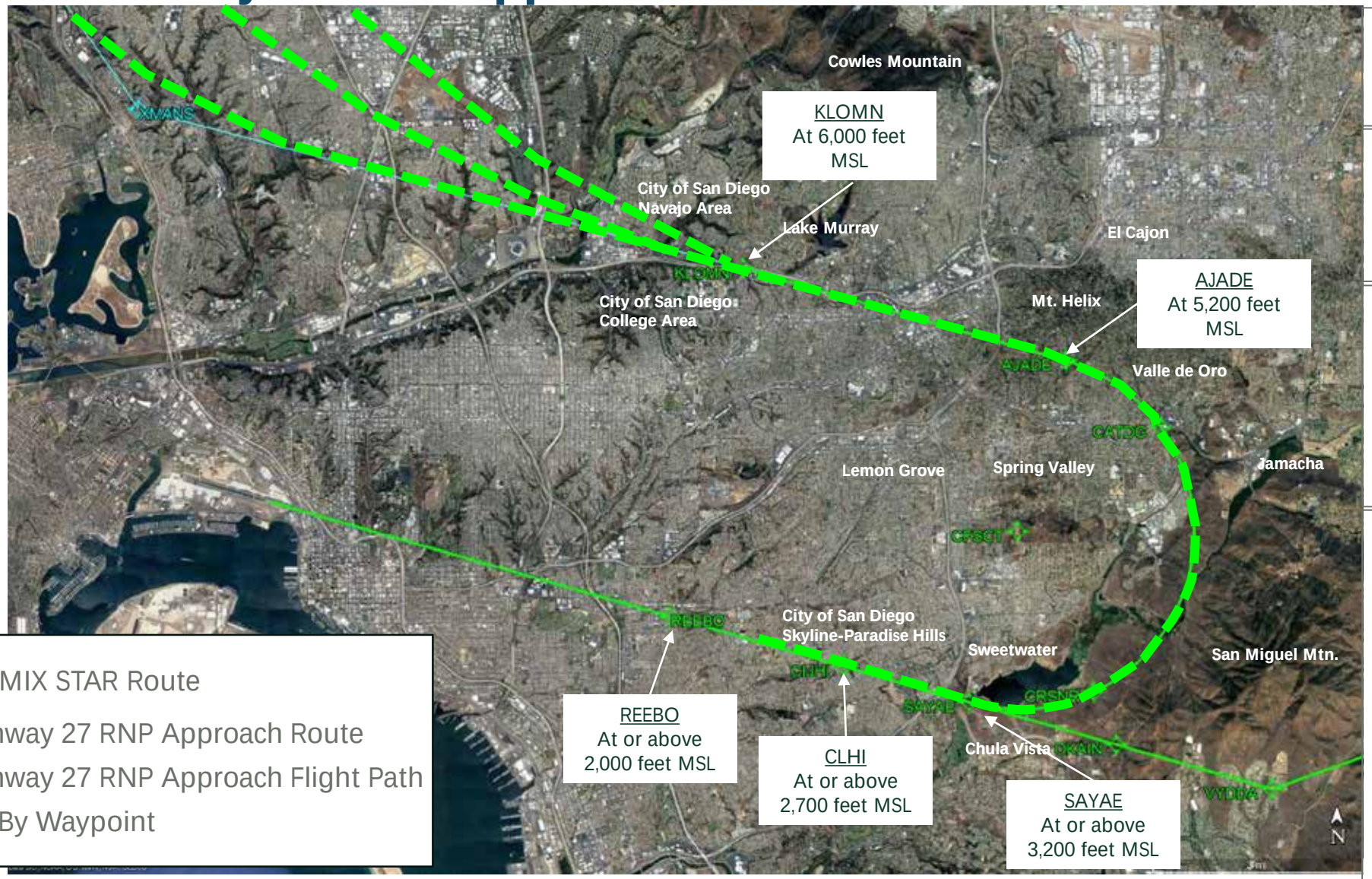
Concept: Discontinue use of the route between the KLOMN and NADDO waypoints and maintain dispersion procedures when air traffic demand is high

Objectives:
1. Raise Altitude on Downwind: No
2. Maintain Dispersion: Yes
3. Turn South Over Less Populated Areas: No

Potential Limitations: FAA may require the proposed Class B airspace be implemented prior to removing the KLOMN to NADDO route

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (modified COMIX STAR concept and flight path).

Maintain Runway 27 RNP Approach



Fly By Waypoint

COMIX STAR Route

Runway 27 RNP Approach Route

Runway 27 RNP Approach Flight Path

Fly By Waypoint

Intent: Reduce noise levels by locating arrivals over more compatible areas

Concept: Emphasize use of the Runway 27 RNP approach over ATC directed visual approach

Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: No
3. Turn South Over Less Populated Areas: Yes

Potential Limitations: RNP approach is limited to aircraft with required equipment and pilots authorized to fly the approach.

Would concentrate more arrivals over areas underneath the RNP flight path

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (RNP approach flight path).

Modify COMIX: Keep Arrivals at 6,000 ft up to KLOMN (Remove NADDO Route)

Intent: Reduce noise levels by raising jet arrival altitude, reduce closer turns to Airport and disperse traffic

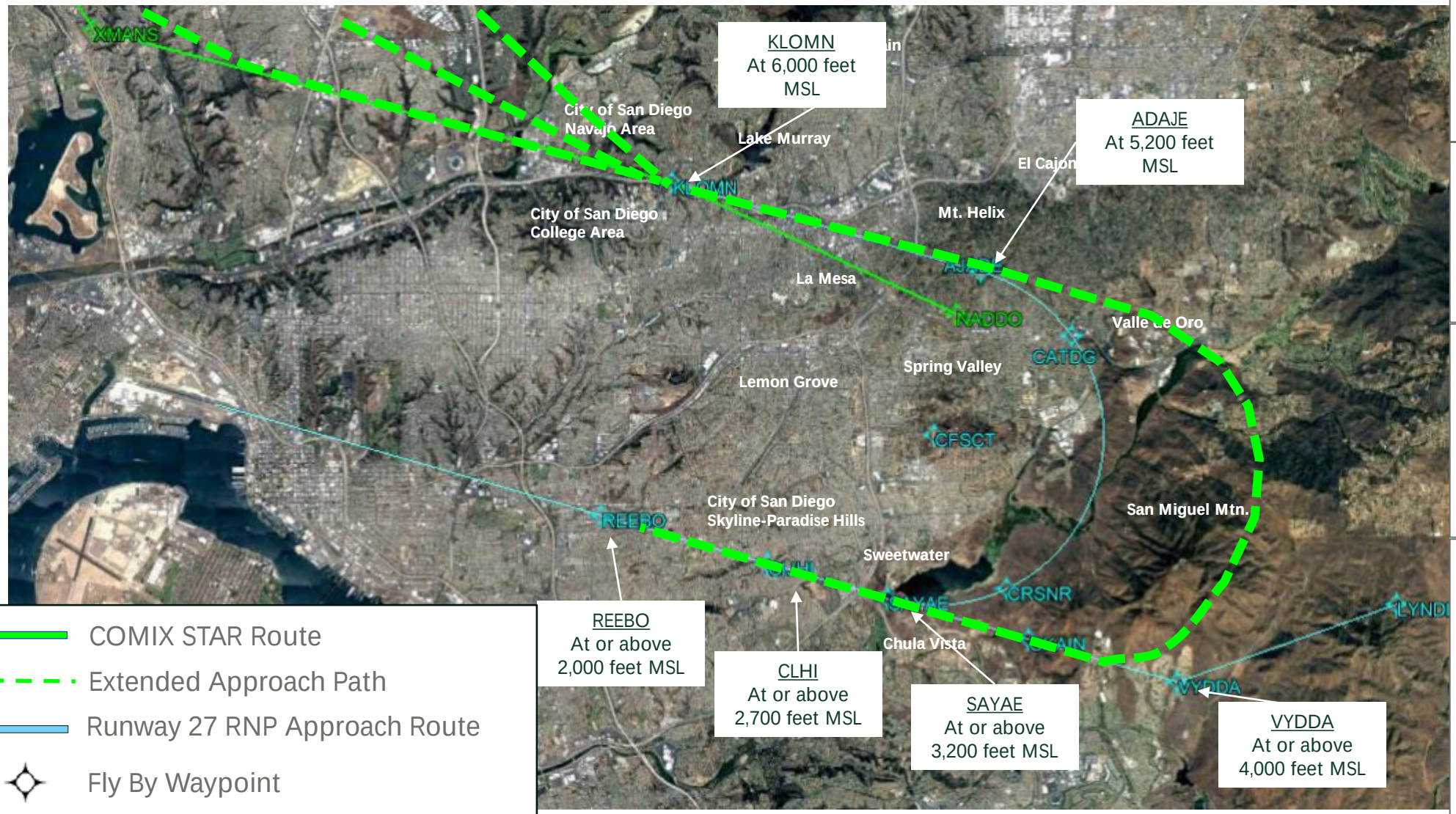
Concept: Remove route to NADDO and keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence descend to join final approach

Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: Yes
3. Turn South Over Less Populated Areas: No

Potential Limitations:
Limits area for FAA ATC to manage traffic to join the final approach. FAA may require the proposed Class B airspace be implemented prior to removing the KLOMN to NADDO route

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (NADDO at 6,000 ft MSL concept).

New RNAV Approach: RNAV Approach from KLOMN to Nearby VYDDA



Intent: Reduce noise levels by raising jet arrival altitude and moving traffic further east

Concept: Keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence follow RNAV approach further east

Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: No
3. Turn South Over Less Populated Areas: Yes

Potential Limitations:
Adds complexity to ATC and increases distance. May be applicable when demand levels are low during nighttime hours (11pm to 7 am). FAA acknowledged possible issues with conflicting traffic.

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., July 2019 (proposed extended approach path).

Aircraft Noise Model Screening Results

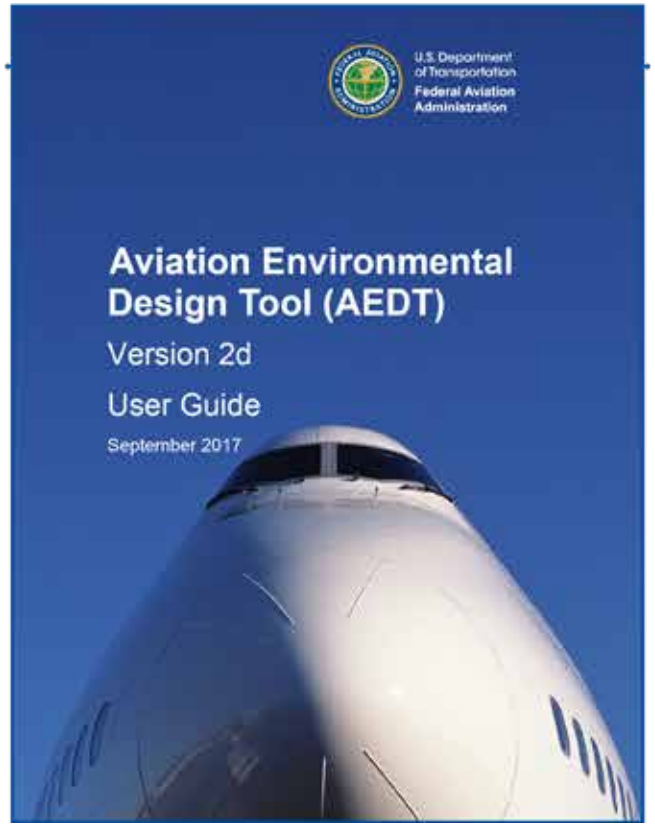
Noise Screening Methodology - AEDT

§ FAA Aviation Environmental Design Tool (AEDT) 2d noise model

INPUT

PHYSICAL
For example:
- Runway layouts
- Airfield elevation
- Atmospheric conditions
- Flight tracks

OPERATIONAL
For example:
- Aircraft types
- Aircraft operation numbers
- Airport use by runway
- Flight track



OUTPUT
- Noise exposure contours
- Location-specific detailed reports
- Emissions and fuel consumption

Noise Screening

- **Intent:** Identify and estimate potential decrease or increase in noise caused by implementing a proposed concept RNAV design procedure

- **Approach:** Capture primary jet aircraft noise source from SDIA over community areas where proposed concepts are designed to reduce noise

- **Application:** Provide indications of potential changes in CNEL related to jet traffic subject to change as a result of a proposed concept.

Note: Results do not reflect the cumulative average annual day flight patterns and operations at SDIA; therefore not intended to represent overall existing noise exposure levels

Noise Screening Methodology - Baseline

- **Source:** Authority's Airport Noise and Operations Management System (ANOMS) flight operations and radar track data: May 2017 to December 2017 (note: used same data source for air traffic procedure analysis project for consistency)
- **Operation focus:** Jet arrivals from the northwest to Runway 27
- **Traffic flow focus:**
  - Arrivals from northwest (e.g., COMIX RNAV STAR, HUBRD STAR and FAA ATC radar vectoring from the northwest)

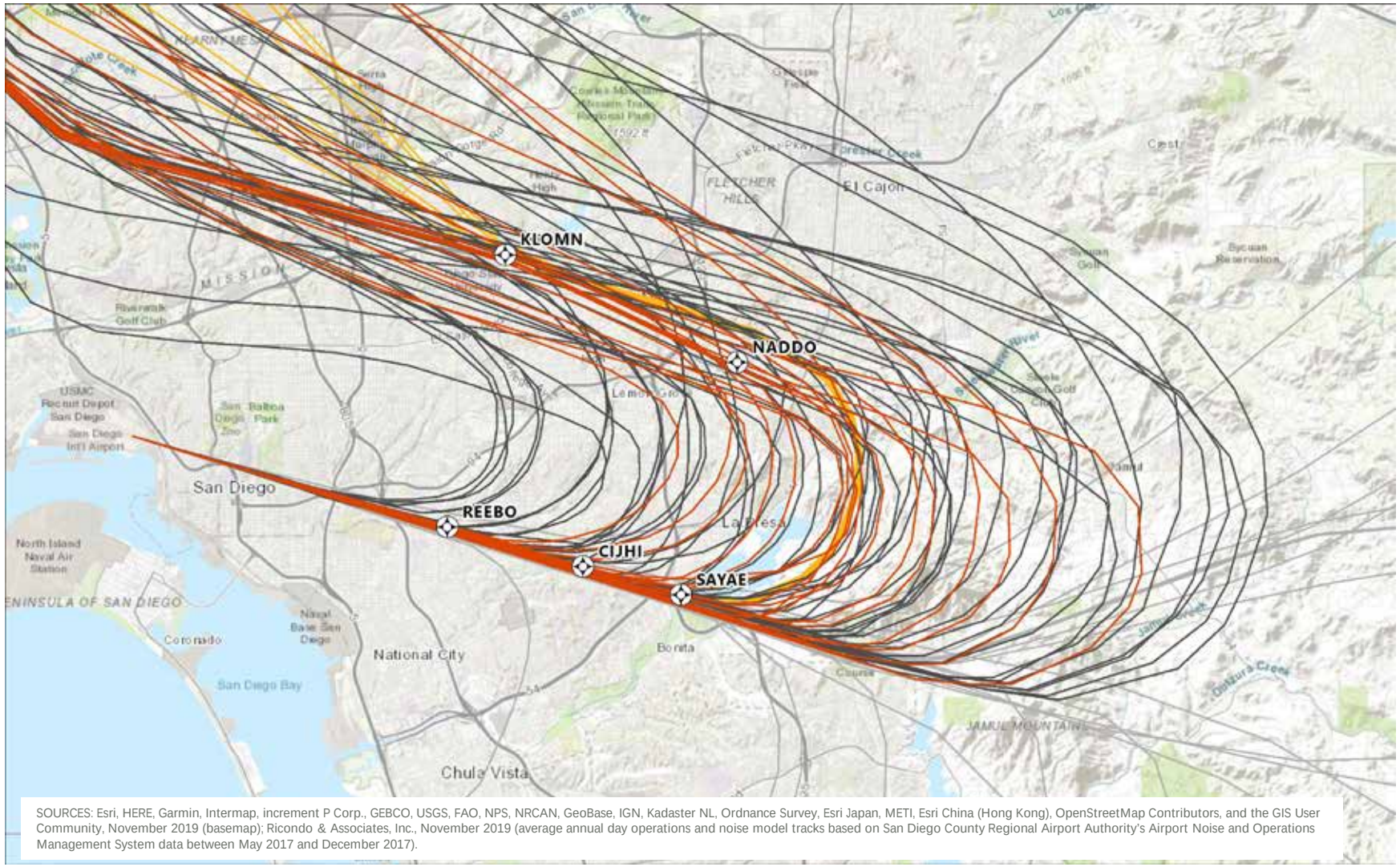
Noise Screening Methodology - Alternative

- **Develop** new noise model tracks for new proposed procedures
- **Modify** baseline noise model tracks to represent proposed final design flight path
- **Move** baseline operations to alternative noise model tracks
- **Maintain** noise model tracks and operations on tracks for traffic flows not related to proposed changes
- **Compare** CNEL values between Baseline and Alternative scenarios

Modeled Scenario

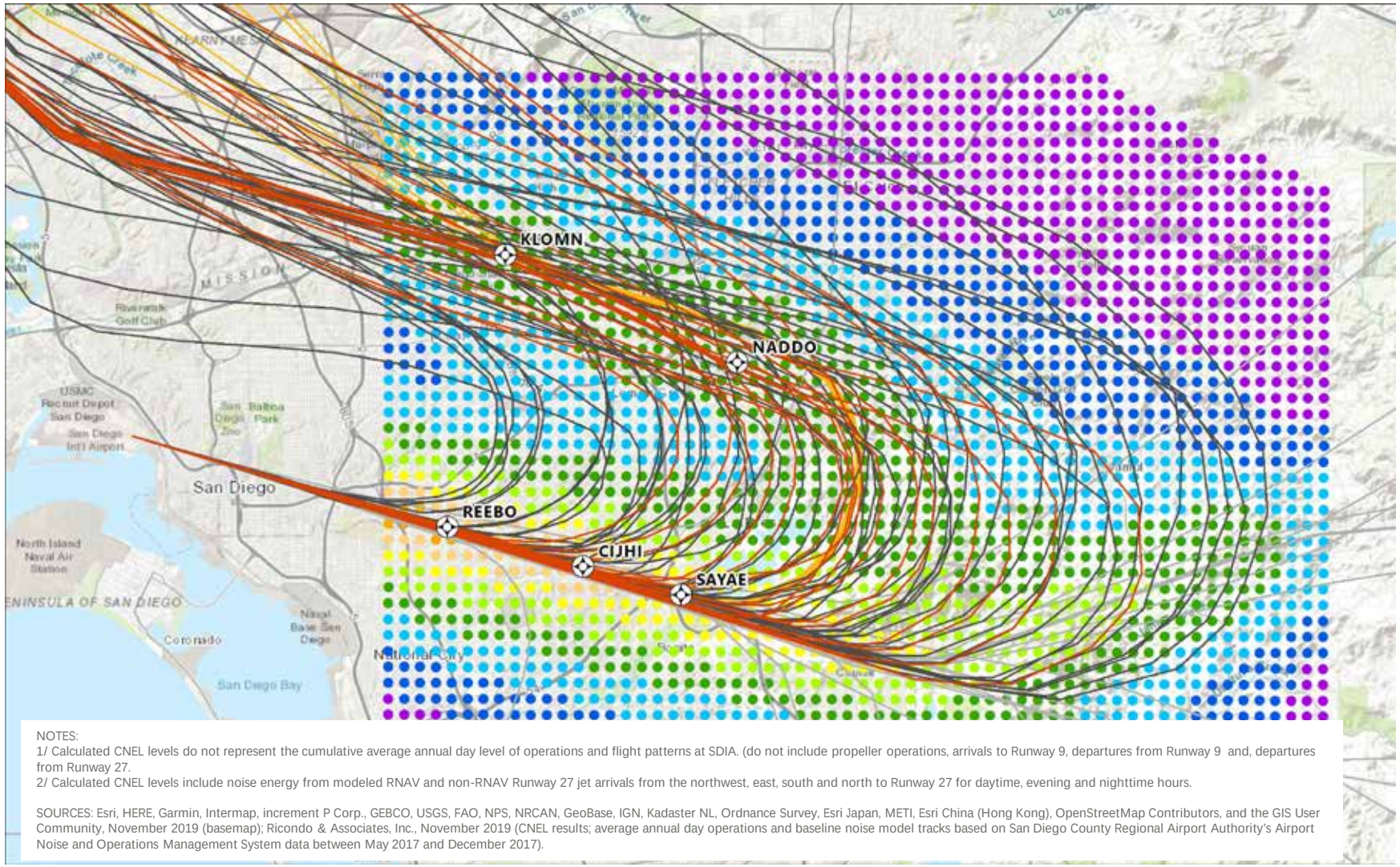
- Changes/Additions from Baseline
  - Modified COMIX RNAV STAR: all jet arrivals that operated between KLOMN and NADDO waypoints under the Baseline
  - Nighttime Runway 27 RNAV Approach: all jet arrivals between 11 p.m. to 7 a.m.
- Maintained from Baseline
  - Runway 27 RNP Approach
  - Turns to final prior to or at KLOMN waypoint
  - Arrival traffic from the north, east and south
- Scenario does not represent cumulative average annual day noise exposure levels

Aircraft Noise Screening - Baseline Model Flight Tracks



SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (average annual day operations and noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

Aircraft Noise Screening - Baseline Model Flight Tracks and CNEL Ranges



LEGEND

Waypoints

Baseline Noise Model Tracks

- Northwest Jet Arrivals from KLOMN to NADDO Waypoints
- Runway 27 RNP Approach for Northwest Jet Arrivals
- FAA ATC Managed Northwest Jet Arrivals
- Jet Arrivals from the North, East and South

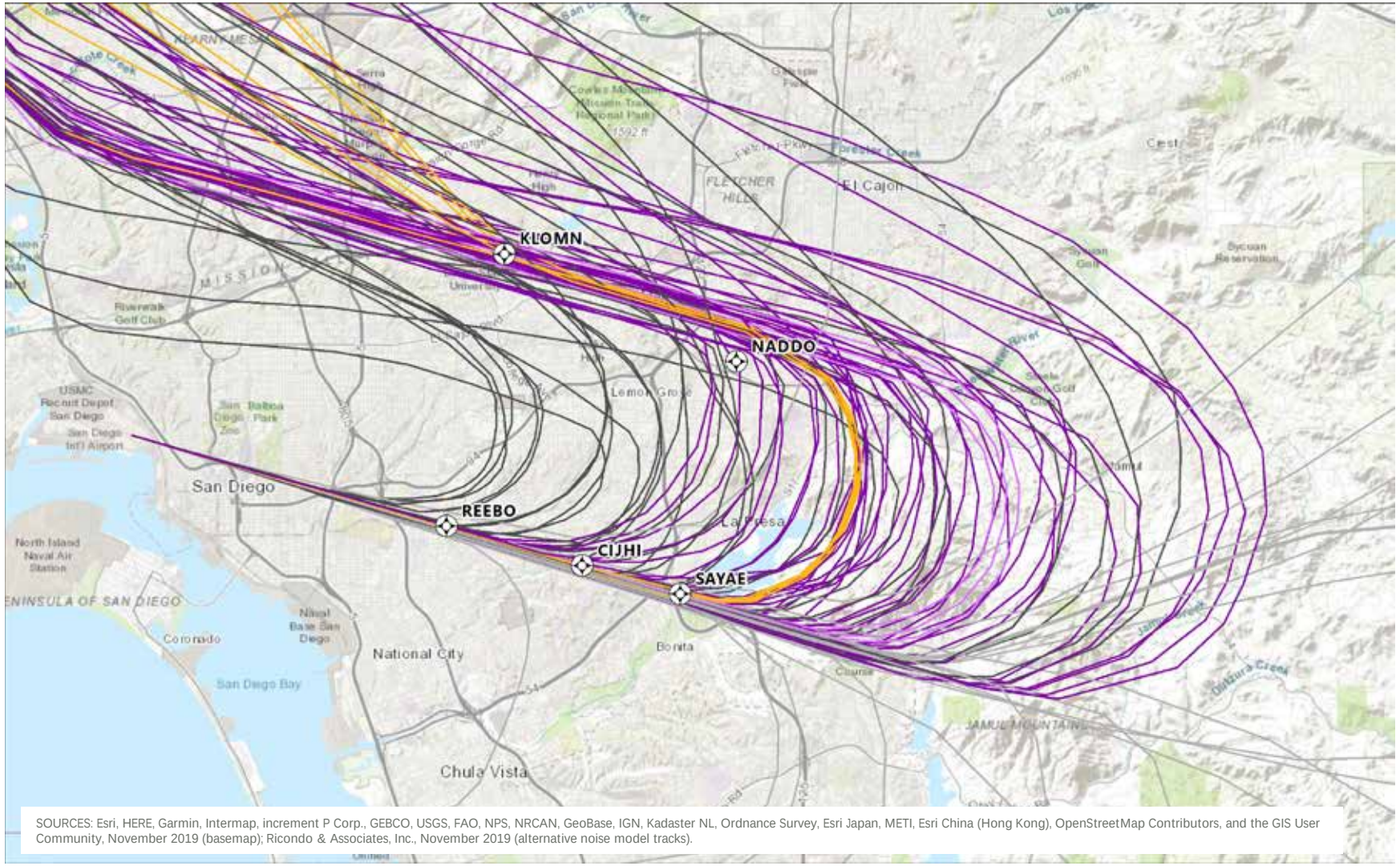
Baseline CNEL Range

- >= 65.00 dB
- 64.99 to 60.00 dB
- 59.99 to 55.00 dB
- 54.99 to 50.00 dB
- 49.99 to 45.00 dB
- 44.99 to 40.00 dB
- 39.99 to 35.00 dB
- 34.99 to 30.00 dB
- < 30.00 dB

NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and, departures from Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

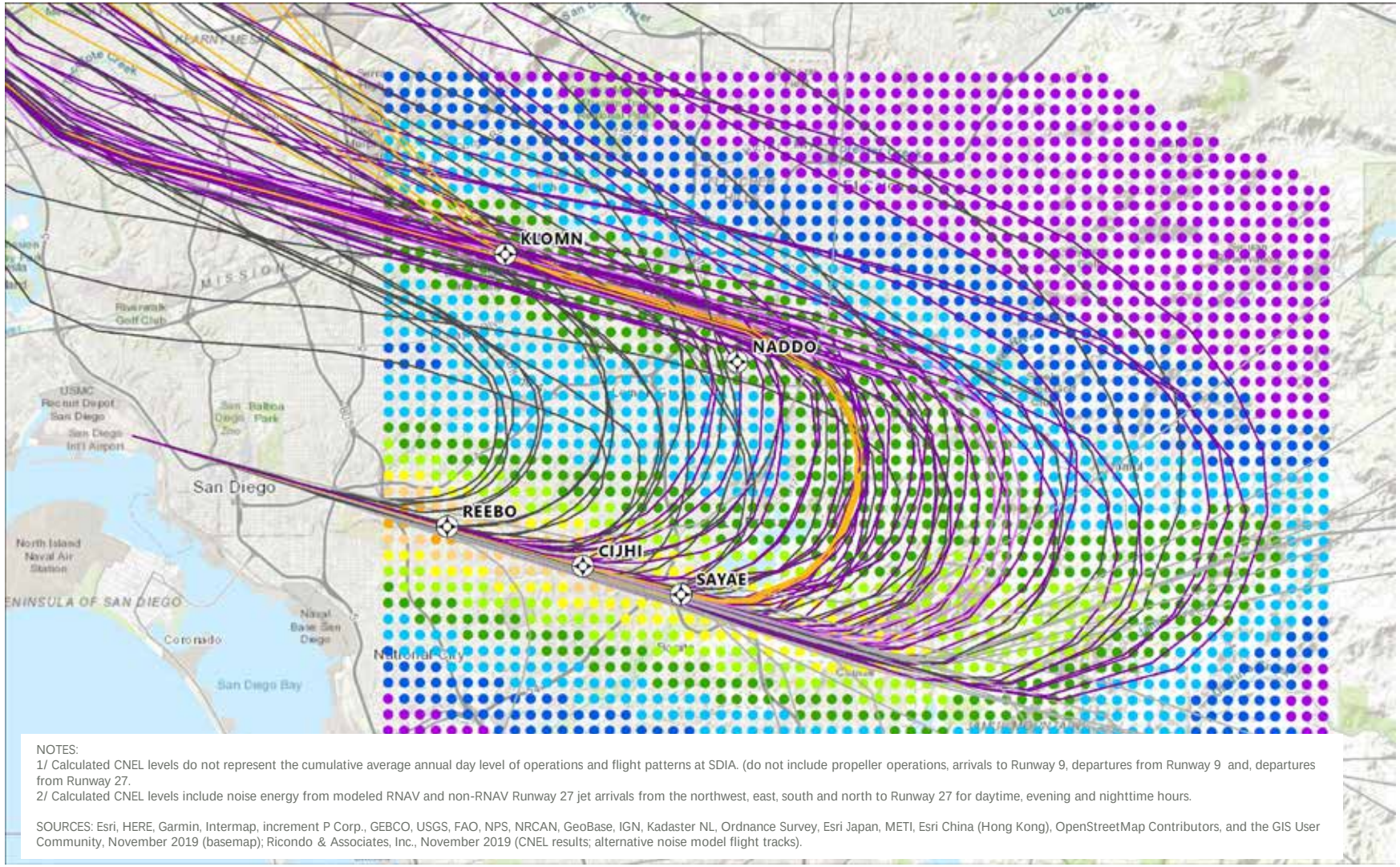
SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL results; average annual day operations and baseline noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

Aircraft Noise Screening – Alternative 1 Model Flight Tracks



SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (alternative noise model tracks).

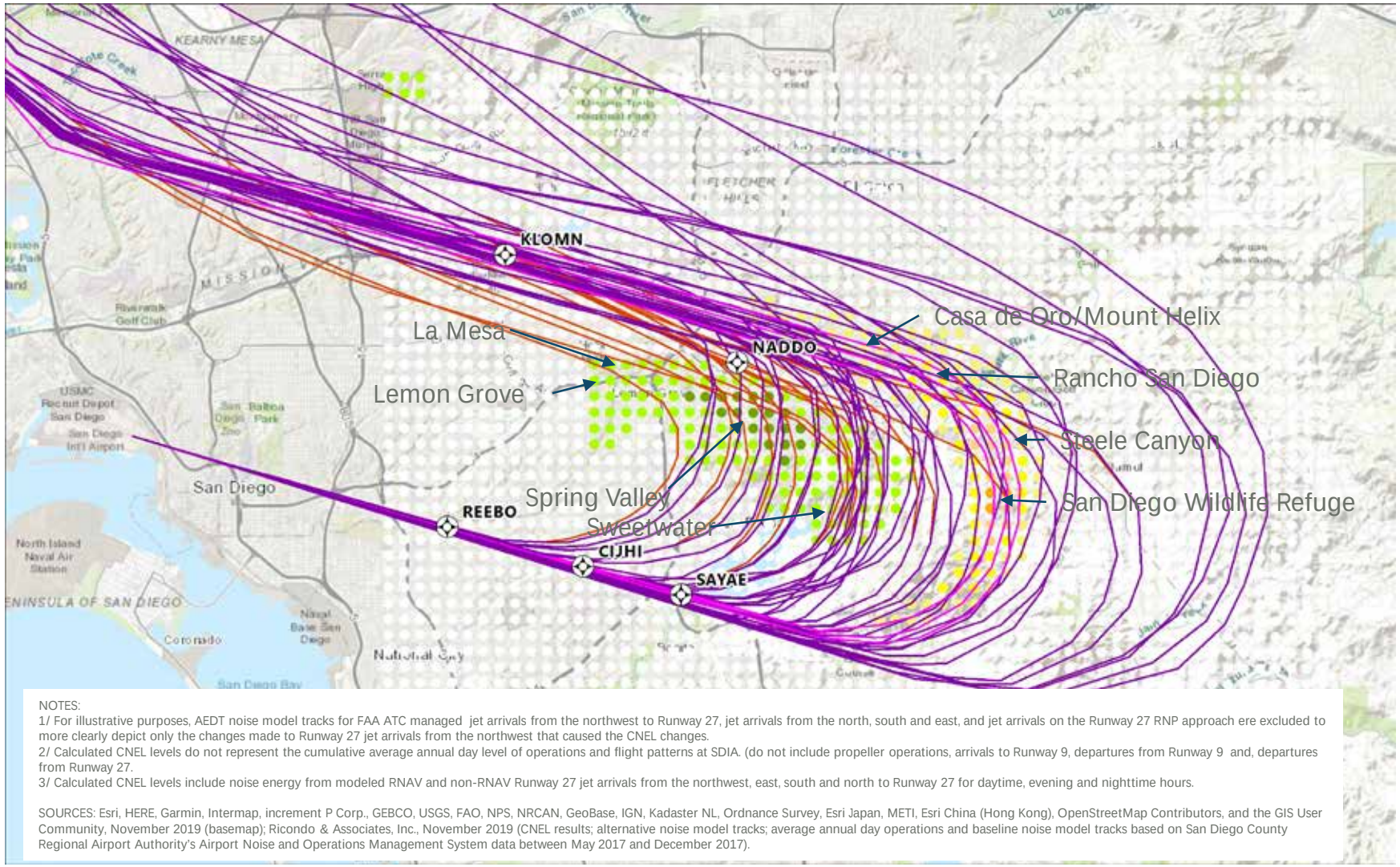
Aircraft Noise Screening – Alternative 1 Model Flight Tracks and CNEL Ranges



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and, departures from Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL results; alternative noise model flight tracks).

Aircraft Noise Screening - AEDT Alternative 1/Baseline Noise Model Tracks and CNEL Changes



NOTES:
1/ For illustrative purposes, AEDT noise model tracks for FAA ATC managed jet arrivals from the northwest to Runway 27, jet arrivals from the north, south and east, and jet arrivals on the Runway 27 RNP approach ere excluded to more clearly depict only the changes made to Runway 27 jet arrivals from the northwest that caused the CNEL changes.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and, departures from Runway 27.
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL results; alternative noise model tracks; average annual day operations and baseline noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

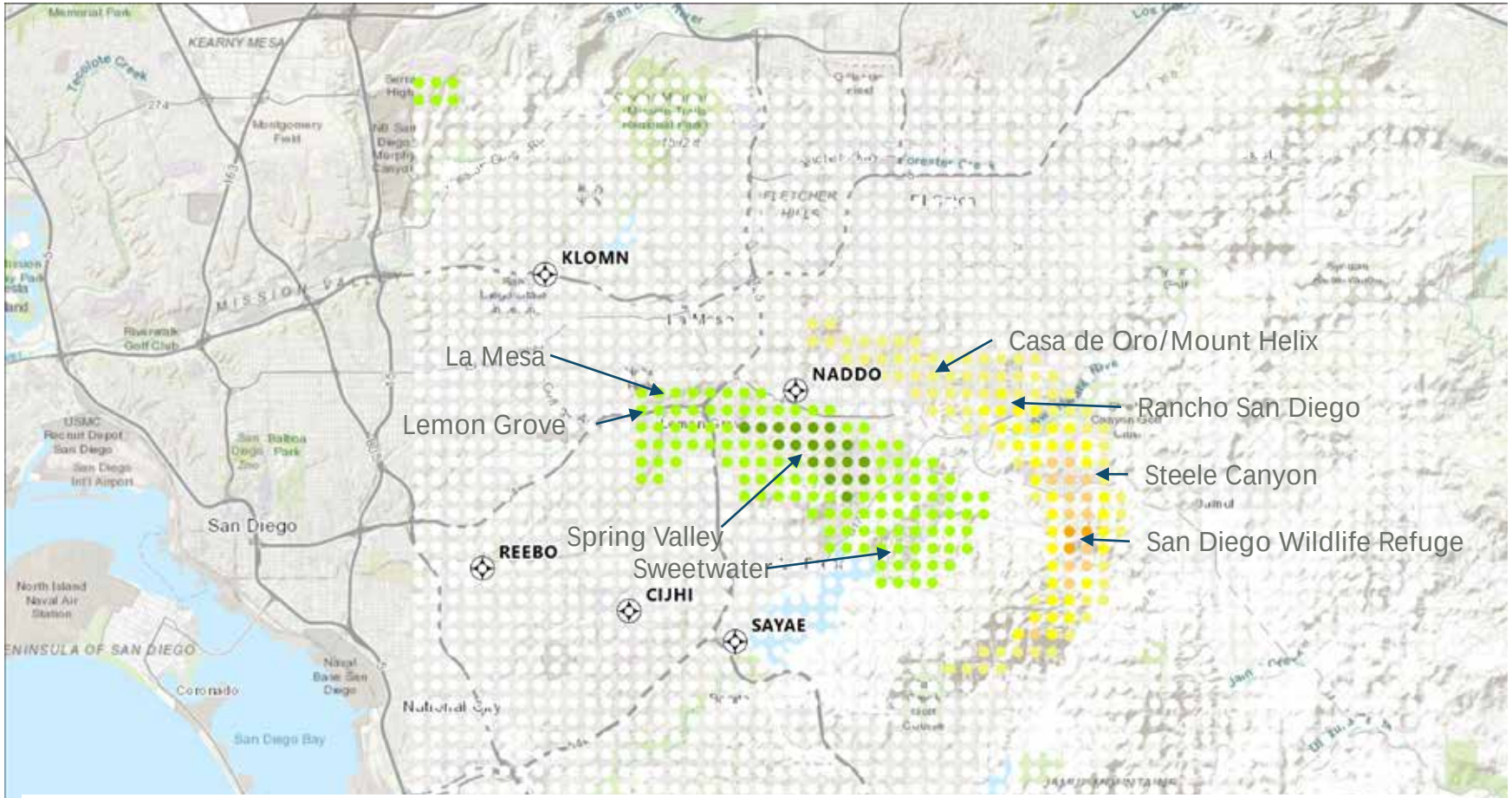
Aircraft Noise Screening – Alterative 1 CNEL Changes

LEGEND

Waypoints

CNEL Change Between Baseline and Alternative 1

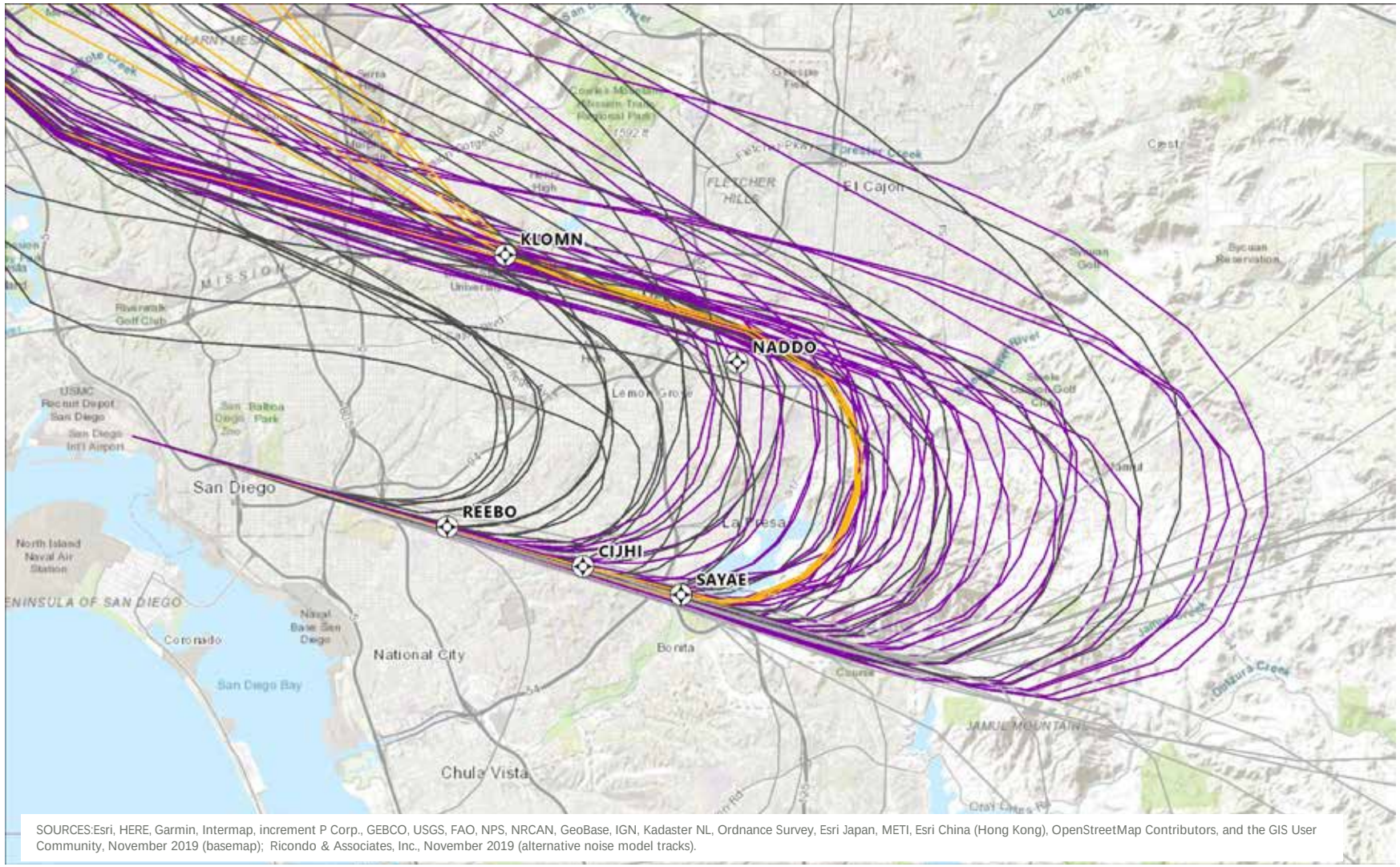
- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and, departures from Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

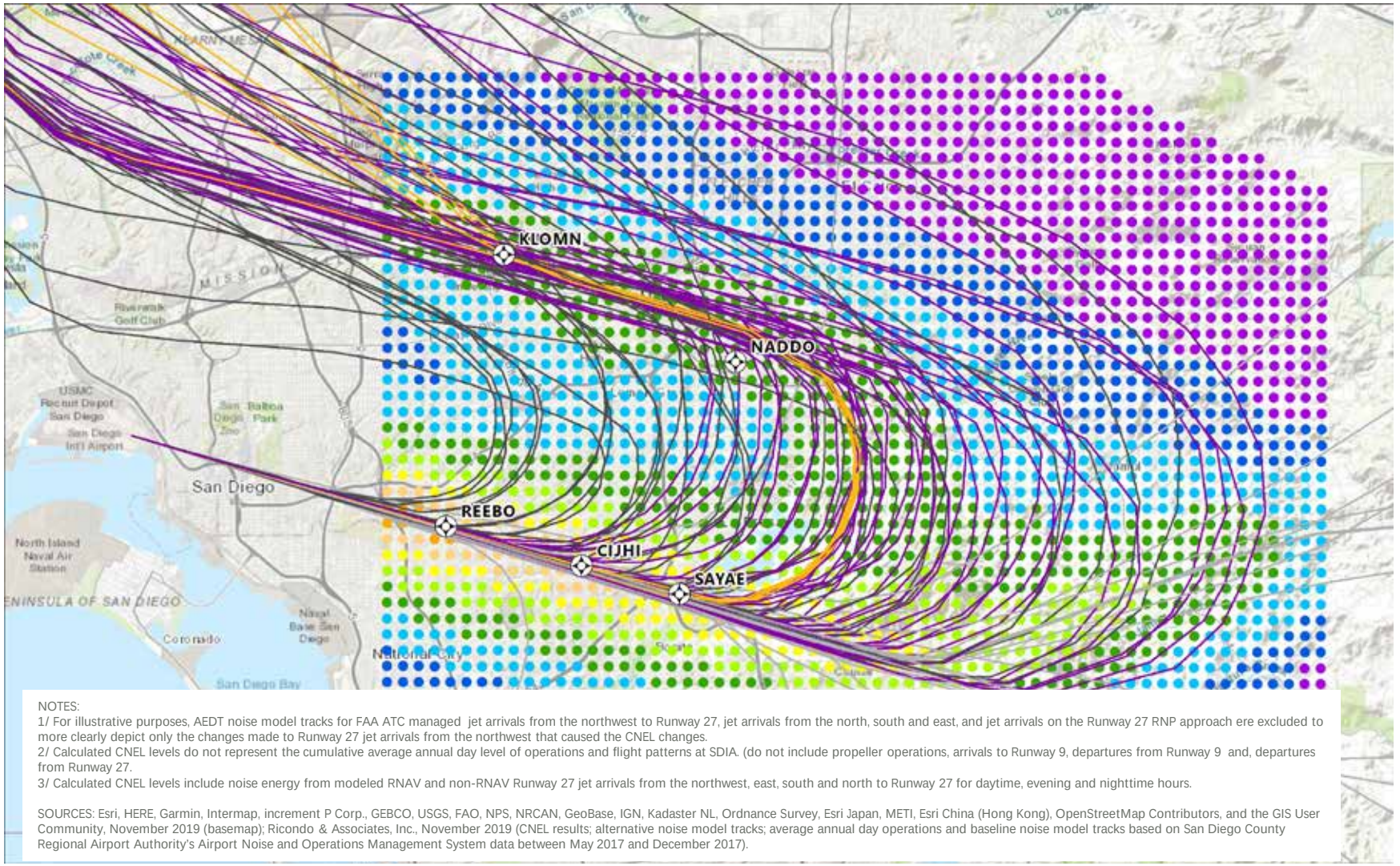
SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL change results).

Aircraft Noise Screening – Alternative 2 Model Flight Tracks



SOURCES:Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (alternative noise model tracks).

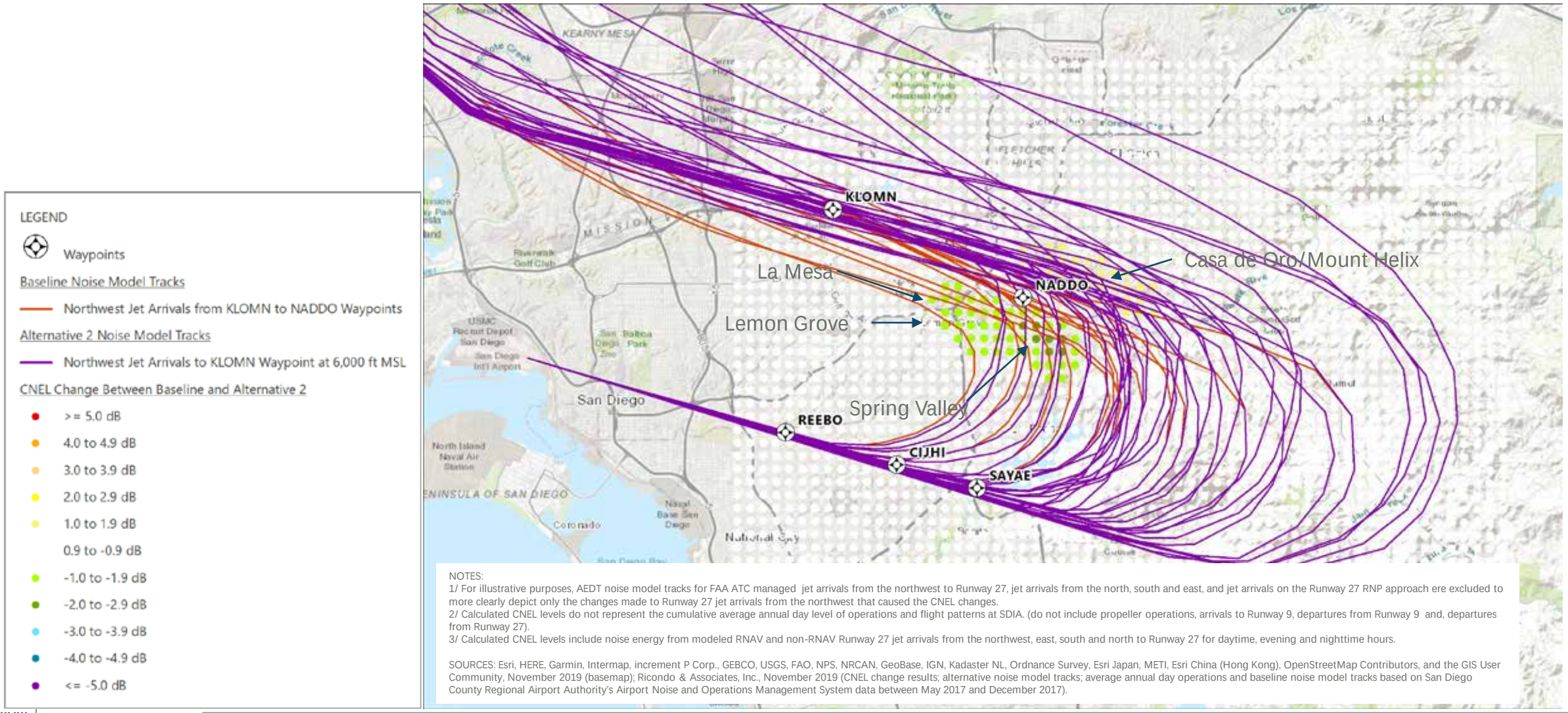
Aircraft Noise Screening – Alternative 2 Model Flight Tracks and CNEL Ranges



NOTES:
1/ For illustrative purposes, AEDT noise model tracks for FAA ATC managed jet arrivals from the northwest to Runway 27, jet arrivals from the north, south and east, and jet arrivals on the Runway 27 RNP approach ere excluded to more clearly depict only the changes made to Runway 27 jet arrivals from the northwest that caused the CNEL changes.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and, departures from Runway 27.
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL results; alternative noise model tracks; average annual day operations and baseline noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

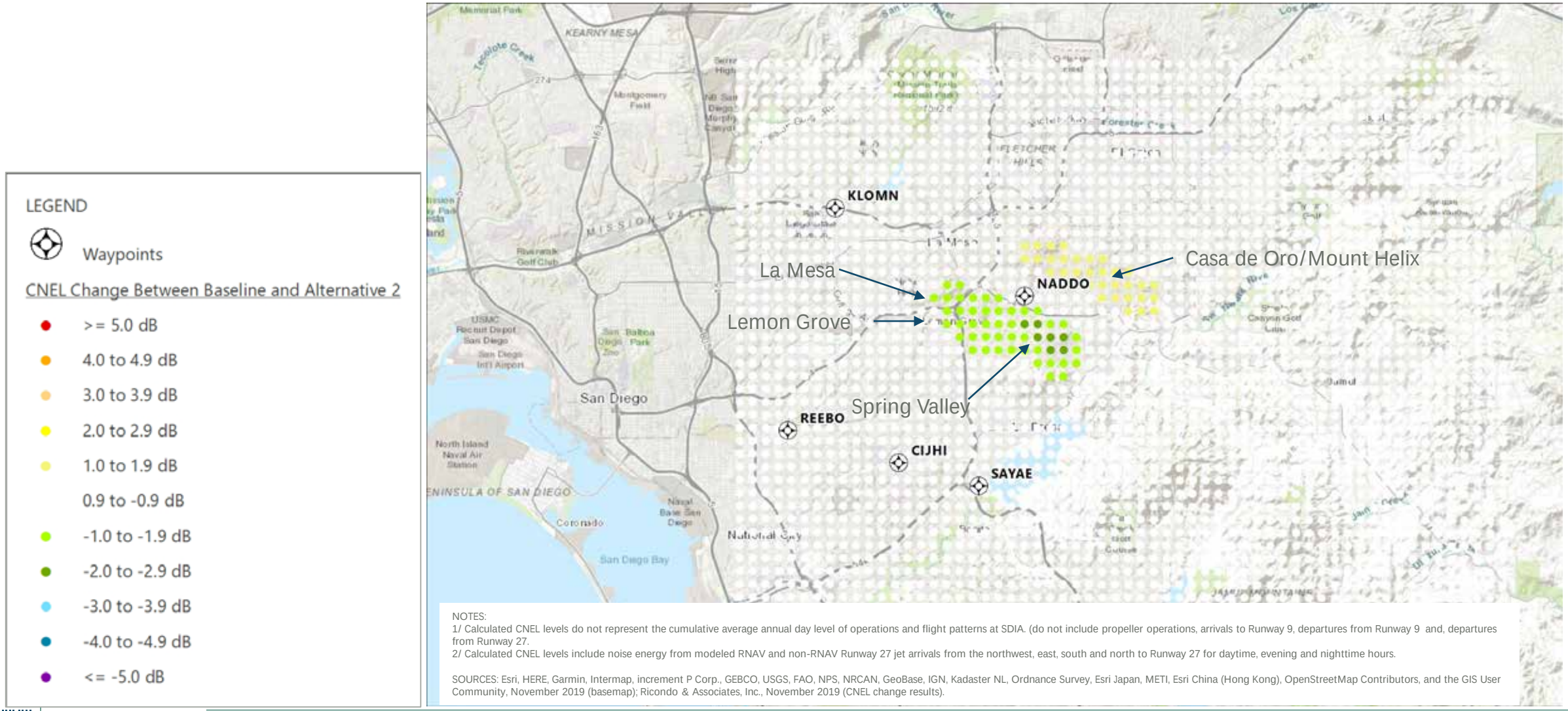
Aircraft Noise Screening - AEDT Alternative 2/Baseline Noise Model Tracks and CNEL Changes



NOTES:
1/ For illustrative purposes, AEDT noise model tracks for FAA ATC managed jet arrivals from the northwest to Runway 27, jet arrivals from the north, south and east, and jet arrivals on the Runway 27 RNP approach ere excluded to more clearly depict only the changes made to Runway 27 jet arrivals from the northwest that caused the CNEL changes.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and, departures from Runway 27).
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL change results; alternative noise model tracks; average annual day operations and baseline noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

Aircraft Noise Screening – Alterative 2 CNEL Changes



Recommendations

Recommendations

- **Alternative 1 (Modify COMIX RNAV STAR and Nighttime RNAV Approach to Runway 27)**: Do not implement proposed nighttime RNAV approach procedure due to substantial increase in noise over areas such as Mount Helix, Rancho San Diego and Steele Canyon area

- **Alternative 2 (Modify COMIX RNAV STAR)**:
  - Based on initial parameters, do not recommend due to the increase in noise
  - ECWG feedback on decrease versus increase

- Encourage Use of COMIX RNAV STAR as designed
  - Keep jet arrivals at 6,000 ft. MSL at KLOMN waypoint while balancing efficiency
  - Evaluate and collaborate with FAA Southern California TRACON

Next Steps

Next Steps

- Present recommendations to ANAC for consideration

RICONDO®

San Diego International Airport
East County Flight Procedure Evaluation

ANAC Information Briefing

PRESENTED TO:
SDIA Airport Noise Advisory Committee

PRESENTED BY:
Stephen C. Smith

PRESENTED ON:
February 19, 2020

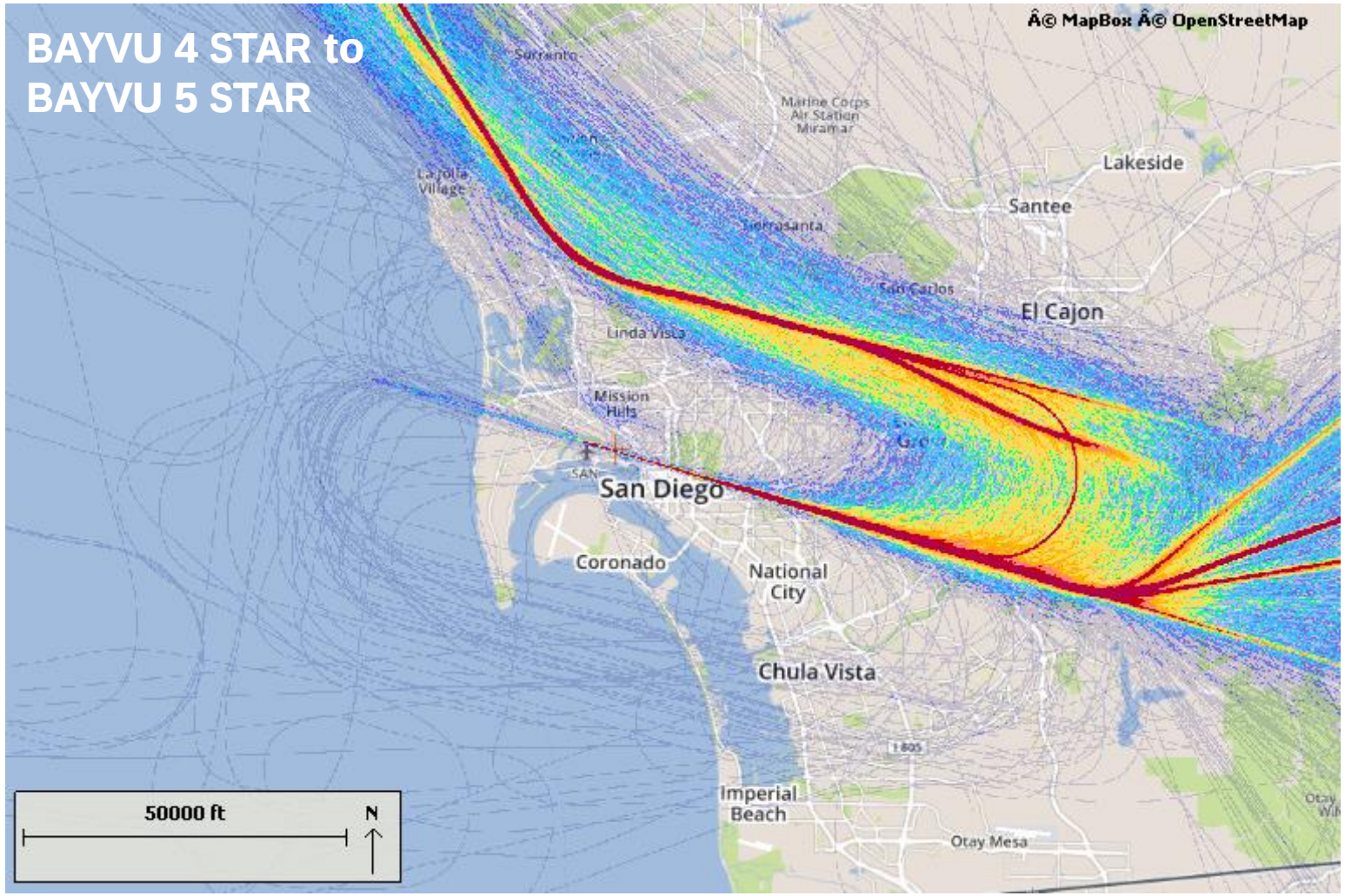
East County Working Group Input

- Conducted five meetings
- Provided the Authority and technical consultant input on aircraft noise concerns
- Reviewed existing and historic flight pattern data to assess and link noise concerns to flight patterns
- Reviewed and provided feedback to technical consultant on noise abatement flight procedure concepts
- Provided input to the Authority and the technical consultant on final design recommendations

Overview of Working Group Concerns

- Change in traffic patterns
- Hearing more noise early morning (6:30 a.m. to 11:00 a.m.) and at night (10:00 p.m. to 11:00 p.m.)
- Do not increase noise in other areas
- Low flying aircraft
- Increase in overflight frequency

Runway 27 Arrivals - Flight Track Density Analysis
San Diego Metropolitan Area - November 2016



Track Density Ranges
(count of operations)

1	4	< 1 per day
5	9	
10	15	
16	20	
21	25	
26	30	
31	50	1-2 per day
51	75	
76	100	2-5 per day
101	150	
151	13,950	>5 per day

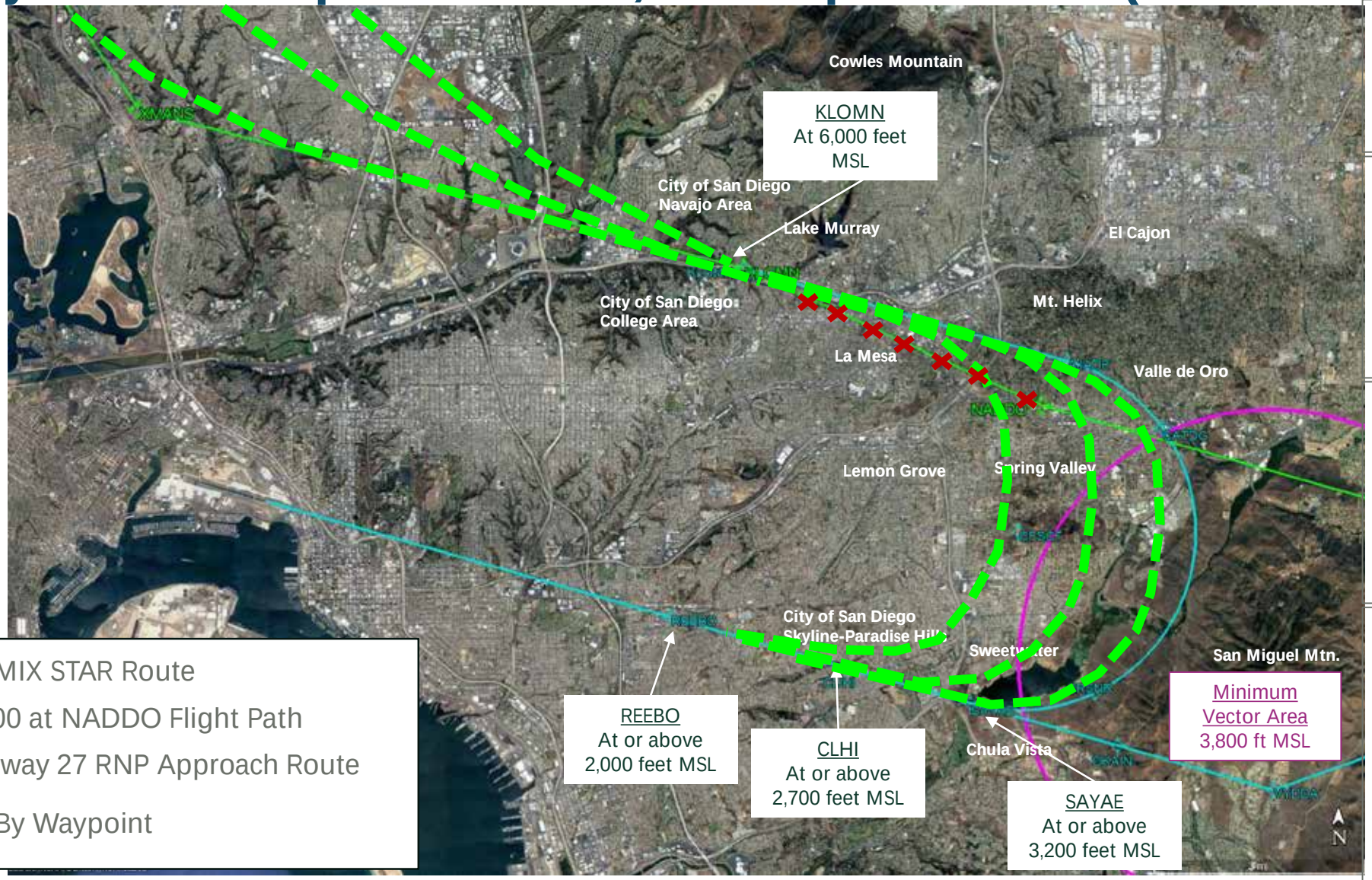
SOURCE: : San Diego County Regional Airport Authority Airport Noise and Operations Management System, November 2018.

Note: Total Runway 27 arrivals was 7,547 for November 2016

Working Group Objectives

- Maintain flight path dispersion
- Raise altitudes over populated areas
- Turn south to join final approach over less populated areas

Modify COMIX: Keep Arrivals at 6,000 ft up to KLOMN (Remove NADDO Route)



Intent: Reduce noise levels by raising jet arrival altitude, reduce closer turns to Airport and disperse traffic

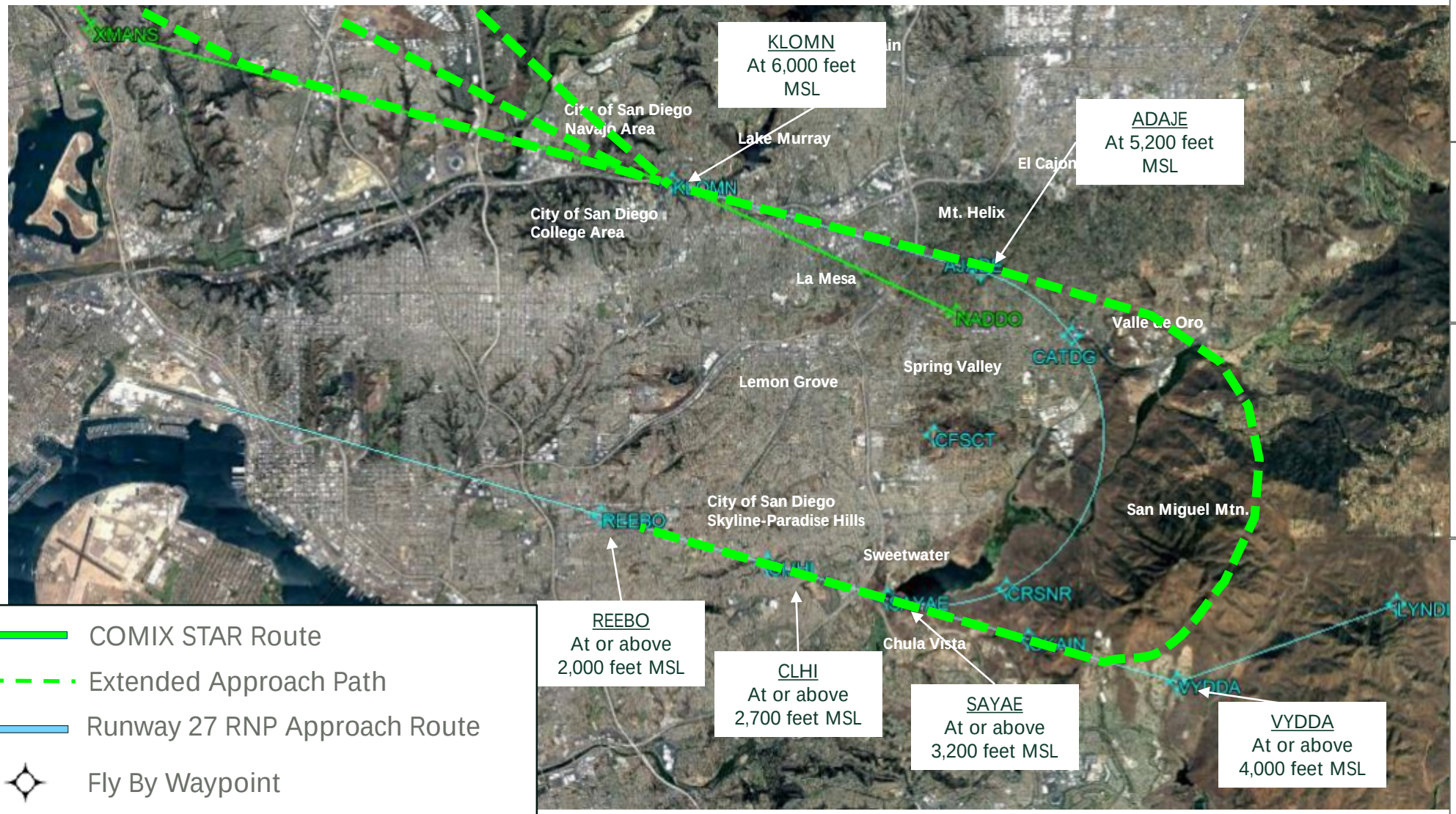
Concept: Remove route to NADDO and keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence descend to join final approach

Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: Yes
3. Turn South Over Less Populated Areas: No

Potential Limitations:
Limits area for FAA ATC to manage traffic to join the final approach. FAA may require the proposed Class B airspace be implemented prior to removing the KLOMN to NADDO route

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (NADDO at 6,000 ft MSL concept).

New RNAV Approach: RNAV Approach from KLOMN to Nearby VYDDA



Intent: Reduce noise levels by raising jet arrival altitude and moving traffic further east

Concept: Keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence follow RNAV approach further east

Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: No
3. Turn South Over Less Populated Areas: Yes

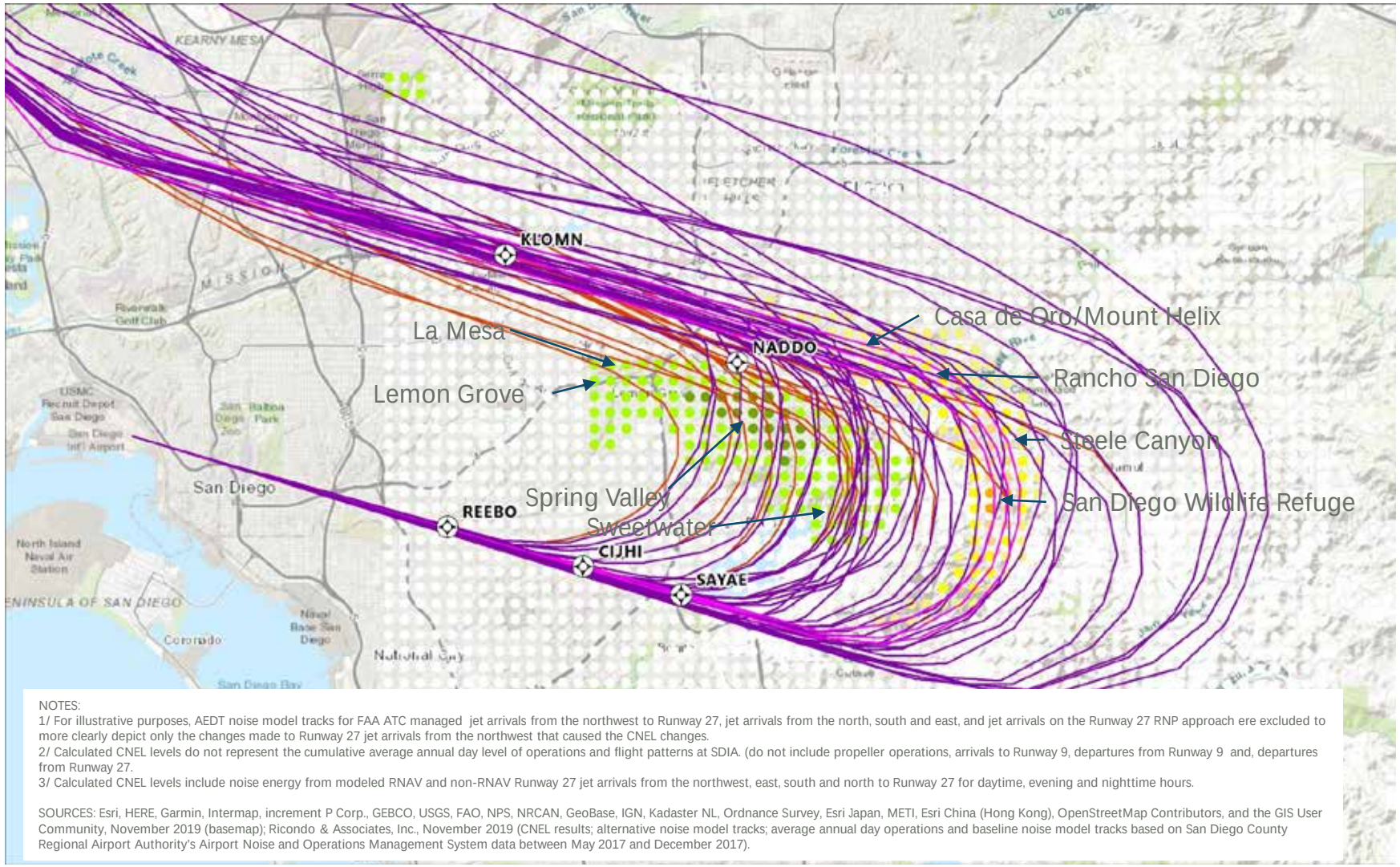
Potential Limitations:
Adds complexity to ATC and increases distance. May be applicable when demand levels are low during nighttime hours (11pm to 7 am). FAA acknowledged possible issues with conflicting traffic.

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., July 2019 (proposed extended approach path).

Modeled Scenario

- Changes/Additions from Baseline
  - Modified COMIX RNAV STAR: all jet arrivals that operated between KLOMN and NADDO waypoints under the Baseline
  - Nighttime Runway 27 RNAV Approach: all jet arrivals between 11 p.m. to 7 a.m.
- Maintained from Baseline
  - Runway 27 RNP Approach
  - Turns to final prior to or at KLOMN waypoint
  - Arrival traffic from the north, east and south
- Scenario does not represent cumulative average annual day noise exposure levels

Aircraft Noise Screening - AEDT Alternative 1/Baseline Noise Model Tracks and CNEL Changes



LEGEND

Waypoints

Baseline Noise Model Tracks

Northwest Jet Arrivals from KLOMN to NADDO Waypoints

Alternative 1 Noise Model Tracks

Northwest Jet Arrivals to KLOMN Waypoint at 6,000 ft MSL

Nighttime Runway 27 RNAV Approach for Northwest Jet Arrivals (11 p.m. to 7 a.m.)

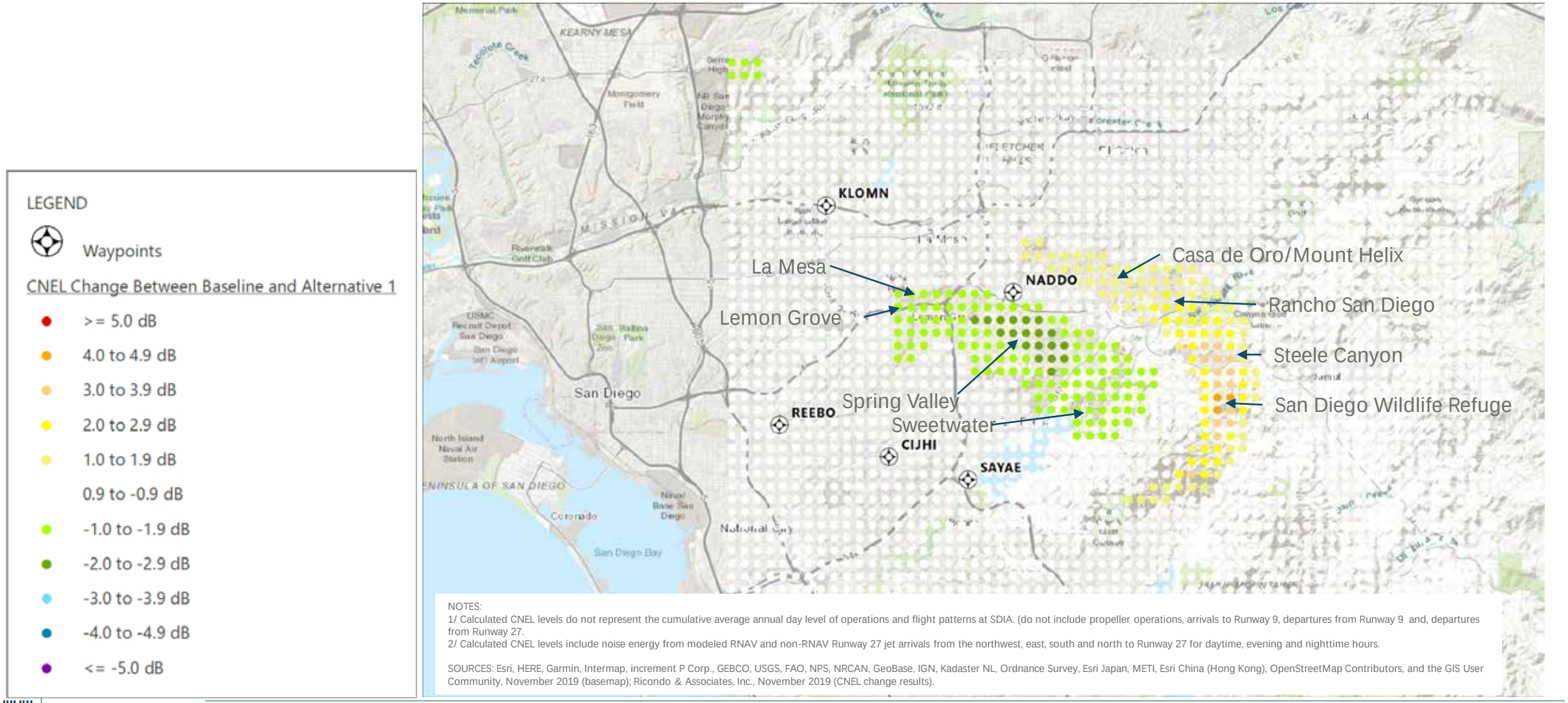
CNEL Change Between Baseline and Alternative 1

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB

NOTES:
1/ For illustrative purposes, AEDT noise model tracks for FAA ATC managed jet arrivals from the northwest to Runway 27, jet arrivals from the north, south and east, and jet arrivals on the Runway 27 RNP approach ere excluded to more clearly depict only the changes made to Runway 27 jet arrivals from the northwest that caused the CNEL changes.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and, departures from Runway 27.
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL results; alternative noise model tracks; average annual day operations and baseline noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

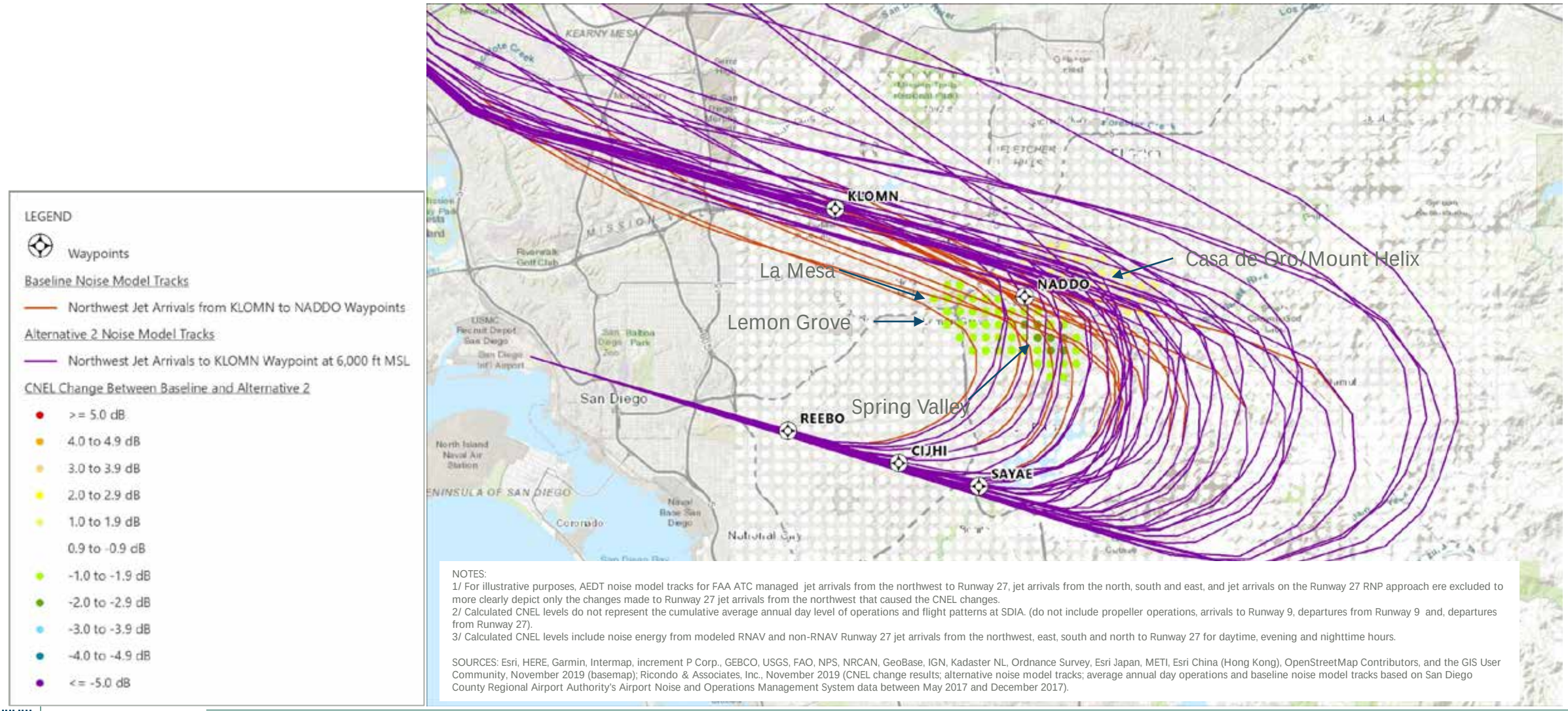
Aircraft Noise Screening – Alterative 1 CNEL Changes



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and, departures from Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL change results).

Aircraft Noise Screening - AEDT Alternative 2/Baseline Noise Model Tracks and CNEL Changes



NOTES:
1/ For illustrative purposes, AEDT noise model tracks for FAA ATC managed jet arrivals from the northwest to Runway 27, jet arrivals from the north, south and east, and jet arrivals on the Runway 27 RNP approach ere excluded to more clearly depict only the changes made to Runway 27 jet arrivals from the northwest that caused the CNEL changes.
2/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and, departures from Runway 27).
3/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL change results; alternative noise model tracks; average annual day operations and baseline noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

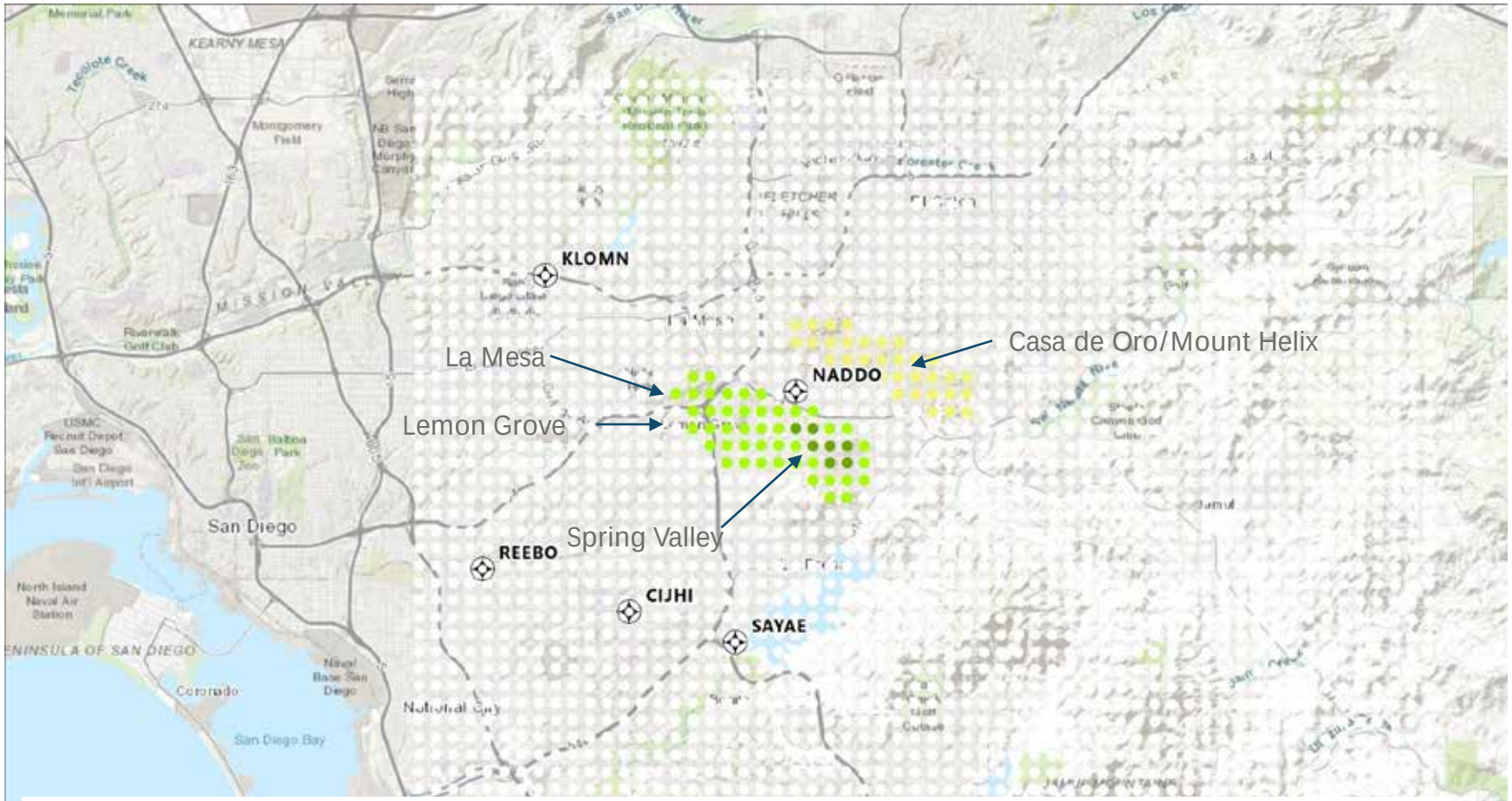
Aircraft Noise Screening – Alterative 2 CNEL Changes

LEGEND

Waypoints

CNEL Change Between Baseline and Alternative 2

- >= 5.0 dB
- 4.0 to 4.9 dB
- 3.0 to 3.9 dB
- 2.0 to 2.9 dB
- 1.0 to 1.9 dB
- 0.9 to -0.9 dB
- -1.0 to -1.9 dB
- -2.0 to -2.9 dB
- -3.0 to -3.9 dB
- -4.0 to -4.9 dB
- <= -5.0 dB



NOTES:
1/ Calculated CNEL levels do not represent the cumulative average annual day level of operations and flight patterns at SDIA. (do not include propeller operations, arrivals to Runway 9, departures from Runway 9 and, departures from Runway 27.
2/ Calculated CNEL levels include noise energy from modeled RNAV and non-RNAV Runway 27 jet arrivals from the northwest, east, south and north to Runway 27 for daytime, evening and nighttime hours.

SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (CNEL change results).

Recommendations

- **Alternative 1 (Modify COMIX RNAV STAR and Nighttime RNAV Approach to Runway 27)**: Do not implement proposed nighttime RNAV approach procedure due to substantial increase in noise over areas such as Mount Helix, Rancho San Diego and Steele Canyon area

- **Alternative 2 (Modify COMIX RNAV STAR)**:
  - Based on initial parameters, do not recommend due to the increase in noise
  - ECWG feedback: concurred with technical consultant's recommendation due to potential noise increases

- Encourage FAA air traffic controllers use COMIX RNAV STAR as designed as much as possilbe
  - Keep jet arrivals at 6,000 ft. MSL at KLOMN waypoint while balancing efficiency
  - Evaluate and collaborate with FAA Southern California TRACON

Next Steps

- Send letter to FAA to:
  - Inform FAA of East County noise concerns related to jet arrivals to SDIA
  - Encourage FAA to keep aircraft at 6,000 feet Mean Sea Level at or near the KLOMN waypoint as frequently as possible

APPENDIX B EAST COUNTY WORKING GROUP COMMENTS/RESPONSES

Ricondo & Associates, Inc. (Ricondo) considered input provided by ECWG at the meetings and in writing. ECWG written comments on materials presented at Meeting #3 (May 28, 2019) and responses are provided below in this Appendix.

TABLE B-1 (1 OF 3) EAST COUNTY WORKING GROUP MEETING #3 (MAY 28, 2019) INPUT AND CONSULTANT TEAM RESPONSES

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM ECWG MEMBER	RESPONSE
6/2/19	Marie Knox	Mount Helix	Maintain 6,000'to NADDO	E-1	Keep arrivals at 6k feet until NADDO waypoint, pages 10,11,12. I think that this is a good suggestion but I also understand that height in altitude will require the flight to go further east in order to be able to make the descent and it will bring southbound traffic closer to traffic from the east, reducing the area to join final approach from 8 to 3 nautical miles. That limited area to manage traffic may be considered infeasible by the FAA. I suspect that this would be a difficult solution for the FAA to accept.	Commenter is correct that limiting the area where FAA can manage traffic may be considered infeasible by the FAA, which led to the reason why the concept was eliminated from further consideration.
			Emphasize Use of Runway 27 RNP Approach	E-2	I need clarification on this suggestion. I understand that RNP is Required Navigation Performance, is this suggestion asking ATC to instruct flights to use the navigation that is programmed in their aircraft as opposed to telling the pilot that he can fly the plane RNAV? If the answer is yes, I have a second question. Steve listed a concern to this suggestion as aircrafts using this approach need the equipment and the pilots must be authorized to fly this approach. My question is, what percentage of the arrivals going over East county have the required equipment and pilots that are authorized to use this approach? The answer will provide information needed to know how much more traffic to expect on this flight path. I think Steve said that it is about 30 percent in a past meeting, but I am asking for verification. This suggestion seems that it could be the most feasible of the suggestions because asking ATC to use the flight path that is programmed into the navigation of some aircraft is a very simple thing to ask, please correct me if I am wrong about this. My understanding about this suggestion is that this is not being used all the time because ATC is giving pilots permission to use RNAV and VFR, which allows flights to turn early, and doing this would keep flights more on a charted flight path, please correct me if that is wrong. I hope we discuss it further at our next meeting	The proposed measure related to the RNAV RNP Z Runway 27 approach emphasized increase use of the procedure compared to current use. The RNAV RNP Z approach could be selected by the pilot as long as the pilot and aircraft are certified to fly the procedure. Selecting the approach typically takes place when the flight plan is filed by the pilot or airline. Increasing the use of the approach would require airlines to file the procedure more frequently in their flight plans and FAA ATC to keep the aircraft on the procedure. Due to the complexity in merging the arrivals from the northwest with those from the east, FAA ATC may not be able to keep every arrival from the northwest on the RNAV RNP Z Runway 27 approach. Based on reviewing the Authority's Airport Noise and Operations Monitoring System (ANOMS) radar flight track data between January 2019 to June 2019, the percentage of all jet arrivals from the northwest that follow along the RNAV RNP Z Runway 27 approach ranged between 19 to 25 percent. Reasons for the low use is most likely a combination of equipage and the complexity with merging arrivals from the northwest with those from the east on the final approach. Application of the visual approach clearance provided by FAA ATC provides the most efficient means to manage the complex merge of traffic on the final approach. The intent of the proposed measure was to increase the use over 50 percent to provide relief to residents who do not live under the flight path. The concern for ECWG is the effects of increasing the frequency of concentrated traffic over residents, which was the reason for eliminating the concept from further consideration.
			Runway 27 RNAV Visual Approach	E-3	I suggested this to Steve last year during open comment on the Citizen Advisory Committee for the Part 150 Update in September 2018. I am attaching a copy of my comments. In October 2018, Steve responded that in November 2016, the FAA added the procedure between KLOMN and NADDO as part of the BAYVU5 amendment. The FAA also added RNP approach to Runway 27, which starts at KLOMM and is similar to the Sweetwater Visual Approach, and which is discussed above in the second suggestion on page 13. It is at this point, I start to suspect that the suggestions on pages 13,14 and 15 are something that could be discussed together. Page 13 is simply asking the FAA to use the Runway 27 RNP Approach that they made in November 2016 as a amendment to BAYVU5. Page 14 is asking ATC to keep RNP on the Runway 27 Sweetwater Visual Approach path that is used for RNAV. I think that this could be a feasible solution, I hope we discuss it further at our next meeting.	The proposed visual approach concept was very similar to the Sweetwater Visual Approach, but included waypoints that may serve as a secondary means of navigation for pilots. The intent was to direct aircraft along a similar path as the RNAV RNP Z Runway 27 approach with some dispersion. The primary means of navigation must be ground-based visual references such as roadways or any features on the ground a pilot can identify in the air. The features must also be identifiable at night if the procedure is intended for nighttime use. The procedures depicted on pages 13, 14 and 15 were discussed at the July 25, 2019 ECWG meeting. Based on input provided by a ECWG member who is an experienced airline pilot, a visual approach is not preferred over a more predictable procedure aided by current navigation technology. Due to the most likely limited use of the procedure, the visual approach was eliminated from further consideration. As a result of the discussion, two procedure concepts were identified at the July 5, 2019 meeting: ▪ Remove the KLOMN to NADDO route from the COMIX TWO RNAV Standard Terminal Arrival Route (STAR) – remove the concentration of traffic over communities between KLOMN and NADDO waypoints and promote dispersion after the KLOMN waypoint ▪ Design an RNAV Runway 27 approach for low demand periods (nighttime hours) to direct aircraft further east and turn south to join the final approach over less populated areas
			RNAV Runway Transition to Final Approach	E-4	Develop RNAV runway transition to Runway 27 final approach, page 15, is develop a RNAV runway transition that mimics Runway 27 RNP. This also seems like it could be a feasible solution and I would like for us to discuss these 3 suggestions further at our July meeting.	The concept referenced by the commenter was intended to provide an RNAV approach that is similar to the RNAV RNP Z Runway 27 approach that did not require RNP-required equipment on an aircraft and certification for pilots to fly the approach. The concept was intended to increase the frequency of aircraft flying along the existing RNAV RNP Z Runway 27 approach path after the KLOMN waypoint. The concept was discussed on July 25, 2019 and due to the concentration effect over communities under the path, the concept was eliminated from further consideration.
			Remove NADDO in COMIX STAR	E-5	I have researched Class B airspace for work on the Citizen Advisory Committee and spoke to Steve about this in August 2018, I am attaching the letter. It is my understanding that Class B airspace has not been changed in San Diego since 1979 and only because of the terrible collision between a commercial jet into a private plane, colliding midair over North Park during their final approach to land in 1978. I was not able to find the exact date of the last Class B change in San Diego, but I was told this by a retired ATC. If it has been 40 years since Class B airspace has been changed, I do not think the FAA will change Class B airspace to accommodate air traffic noise concerns in East county or San Diego. Also, this idea was not included in the Part 150 Update because of the length of time the process will take for the FAA to complete a Class B redesign in San Diego.	The FAA has been evaluating Class B airspace changes for the past two years. Their effort is independent from the evaluation conducted for the ECWG. The proposed changes FAA is currently considering can affect FAA's evaluation on proposed procedure concepts and was shared with ECWG for informational purposes. The route between KLOMN and NADDO waypoints was developed to resolve Class B excursions. If FAA changes Class B airspace that happens to increase the area under control around the KLOMN waypoint, the need to maintain the route between KLOMN and NADDO may no longer be required. This would assist in supporting the case that the route is no longer required and should be removed from the COMIX RNAV STAR.

TABLE B-1 (2 OF 3) EAST COUNTY WORKING GROUP MEETING #3 (MAY 28, 2019) INPUT AND CONSULTANT TEAM RESPONSES

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM ECWG MEMBER	RESPONSE
			General	E-6	Finally, I would like to ask that a list be made of all East County Working Group members with their name, e-mail address and represented neighborhoods and that the list be shared within the committee and posted on the SDIA website, just as the list of Citizen Advisory Committee names, e-mail addresses and neighborhoods are listed online. I was confused this week at our meeting because there were new faces and voices on the phone, which I did not recognize from previous meetings and I thought a list would be most helpful. I also noticed and spoke with 2 La Mesa residents who attended the Tuesday meeting and I feel a list would be helpful for other La Mesa residents to get in touch with members of the East County Working Group about our progress and next meetings, etc.	With regards to giving out email and contact information for members of the group, to maintain privacy the Authority does not intend to release that information. As a member of the ECWG, the commenter was recommended by Authority staff on June 3, 2019 to reach out to members at the meeting for contact information.
			General	E-7	I have been going over the ANAC sub-committee recommendations to the Part 150 Update and I see that Recommendation 16, addressing arrivals is not going to be included in the final recommendations. If arrivals over La Jolla cannot be remedied for noise, I hope that we will be able to find something that will pass scrutiny for East county arrivals. If we do, when do you think that the FAA would implement any changes for East county? Are your plans to submit suggestions from the East County Working Group to the FAA, before or during the next Part 150 Update, which would be in approximately 4-5 years or longer?	Concepts presented at the July 25, 2019 ECWG meeting did not appear to have major design criteria or aircraft descent performance concerns that were identified for the La Jolla procedure design concepts. Noise screening will be conducted to confirm the proposed designs would not cause a notable increase in aircraft noise. In previous conversations with the FAA, the earliest FAA has indicated implementation would take was two years. After a procedure request is filed using the Instrument Flight Procedure Gateway, FAA will evaluate the request to determine if it is feasible and is consistent with the FAA's mission and goals. If so, the FAA will determine where among all other proposed procedure changes the request is ranked in the implementation schedule. Currently, the FAA had several thousand procedures scheduled for implementation. Therefore, implementation may take between two to five years. The final results of the East County evaluation will be reviewed by the Authority and shared with the Airport Noise Advisory Committee (ANAC). Any design concepts recommended to proceed forward to next steps would proceed forward independent of the Code of Federal Regulation (CFR) Part 150 Study Update.
6/3/19	Raleigh Bouffard		General	E-8	Desirable traits of North arrival operations are track dispersion, higher altitude down winds over populated areas and cross wind turns over less populated areas. Limitations include airspace limits, controller flexibility to slot North arrivals with East arrivals and commercial airliner operational limitations.	The commenter is correct in the overall objectives established by ECWG regarding the desirable traits of flight patterns for arrivals from the northwest.
			Visual Approach	E-9	I would first like to address commercial airliner operational limitations. I believe that there was a mistaken impression left with the group that commercial airline operators are limited in their ability to perform RNAV arrivals/approaches and that cockpit crews are resistant to performing them thus preferring a visual arrival. This is simply not the case. All major operators routinely fly RNAV/VNAV arrivals to an ILS/LOC or RNP approaches throughout the US and the world. The beautiful thing about a well-designed RNAV profile to an approach is that it reduces the workload for the cockpit crew because the pilot gets constant feedback from his/her instruments on where they are relative to the desired flight profile making it easier to manage the energy state of the aircraft. When a pilot accepts a visual approach, things change. A visual approach requires him/her to take on the responsibility of traffic separation, terrain clearance and staying within the confines of the class B airspace all the while calculating how best to get on the proper descent profile. Visual approaches are notorious within the industry for unstable approaches and, when accepted at night, terrain conflicts. That is why when cleared for a visual most pilots will still try to join and fly the profile of an underlying instrument approach, i.e., during a visual to SAN RWY 27 the pilot at a minimum would strive to arrive at REEBO at 2000 feet, per the underlying published LOC RWY 27 approach. If turned further East the pilot would honor the altitude restrictions of CIJHI, OKAIN etc. thus insuring terrain clearance and not busting the floor of the class B. In a nutshell RNAVs are often easier than visuals and you will get no complaints from pilots if they are told to fly a published RNAV arrival.	Comment related to airline operators ability to perform RNAV arrivals/approaches and reduction in pilot workload as a result of operating an RNAV approach compared to a visual approach is noted. The commenter's concerns related to visual approaches and likelihood for unstable approaches was critical feedback in considering the feasibility of the visual approach concept. Due to the increased workload and increased likelihood of unstable approaches, the visual approach concept was eliminated.
			RNAV Runway Transition to Final Approach	E-10	Approach controller flexibility to slot aircraft from the North and East is one of the biggest factors in arrival aircraft management. It is understood that during peak arrival rates controllers want the ability to vector aircraft and use the airspace within the confines of the class B to accomplish that mission. However, it is during the non peak periods, when slotting is not required, that aircraft are still brought in on a 5000-foot downwind and vectored to a final or cleared for a visual that noise mitigation does not seem to be a consideration. It is with this in mind that the following recommendations are made: Design a new RNAV to LOC RWY 27 or to RNAV (GPS) Y that starts at KLOMN and joins the approach at VYDDA. Minimum altitude at AJADE would be 6000 feet. This would raise the downwind to 6000 feet (vice the current 5000 feet) over a heavily populated area and create a descending crosswind turn over a sparsely populated area. I believe this would be the quietest approach for North arrivals and could be done when slotting is not a factor.	Ricondo designed two version of the RNAV approach procedure proposed by the commenter and reviewed the results with ECWG on July 25, 2019. The first version starts at the KLOMN waypoint and joins the final approach at the VYDDA waypoint. Version 1 did not meet FAA Performance-Based Navigation (PBN) design criteria requirements. Version 2 was designed to meet criteria. The procedure joins the final approach near VYDAA, but not at VYDAA waypoint as proposed by the commenter. Ricondo indicated the procedure does conflict with the approach procedure to Montgomery Field and the LUCKI RNAV STAR. Due to the low demand level between 11:00 p.m., and 7:00 a.m., mitigating the procedure conflicts may be possible; therefore, Ricondo recommended proceeding forward with evaluating Version 2.

TABLE B-1 (3 OF 3) EAST COUNTY WORKING GROUP MEETING #3 (MAY 28, 2019) INPUT AND CONSULTANT TEAM RESPONSES

DATE	NAME	REP.	CONCEPT	COMMENT #	COMMENT FROM ECWG MEMBER	RESPONSE
			Descend below 6,000 ft East of KLOMN	E-11	The second most desirable arrival would be for aircraft not to descend from 6000 feet to 5000ft until East of KLOMN with controlled vectors after KLOMN. This could be used when a controller knows he doesn't need a tight turn to slot inbounds from the North but needs them to turn before the previously described new RNAV approach. It would still be a mostly descending profile from KLOMN and therefore quieter than the level 5000ft downwind to a turn. I don't know how easy it would be for a controller to make the determination described but if it is doable it would mitigate aircraft noise.	The commenter's proposed concept is similar to the modified COMIX RNAV STAR design, which eliminates the leg between KLOMN and NADDO waypoints and calls for a 093-degree heading after the KLOMN waypoint and expect radar vectors from FAA ATC. The current COMIX RNAV STAR requires aircraft on the procedure to be at 6,000 feet Mean Sea Level (MSL) at the KLOMN waypoint, which would remain the same in the proposed modified concept.
			Visual Approach	E-12	The least desirable from a noise mitigation point of view would be the current 5000ft level downwind to a vector or visual. This presumably gives approach control the most flexibility within the confines of the current class B and would be used during peak arrival rates.	Comment noted.
			Combined Concepts	E-13	Assuming that the new RNAV arrival above can be designed and noise mitigation becomes part of the arrival aircraft management plan all three of the arrivals described above would be used. In my estimation this would provide the added benefit of greater arrival track dispersion and an overall reduction in aircraft noise complaints.	Comment noted.
			General	E-14	I would like to add one final note. It was brought up that flight crews want to know in advance what approach to expect so as to properly plan for the arrival. This is indeed true. In the three arrivals described above this can be accomplished with a fairly routine ATIS message commonly seen at other airports. An example would be, "expect RNAV LOC RWY 27 or vectors to a visual will be provided" or in the case of non-visual conditions "expect RNAV LOC RWY 27 or vectors to LOC RWY 27 will be provided". In either case the pilot will set up to fly the RNAV LOC RWY 27 but if approach control needs to turn him/her earlier, the he under lying approach (LOC RWY 27) is already set up so that the pilot can see the fixes on the cockpit display, the LOC frequency is dialed in and a short cut is easily handled.	Comment noted.

SOURCE: Ricondo & Associates, Inc., October 2018.

APPENDIX C EAST COUNTY PROCEDURE DESIGN SHEET

The following are the procedure designs sheets for each concept. The design sheets provide a description of the procedure designs, evaluation results and recommendations for each design phase.

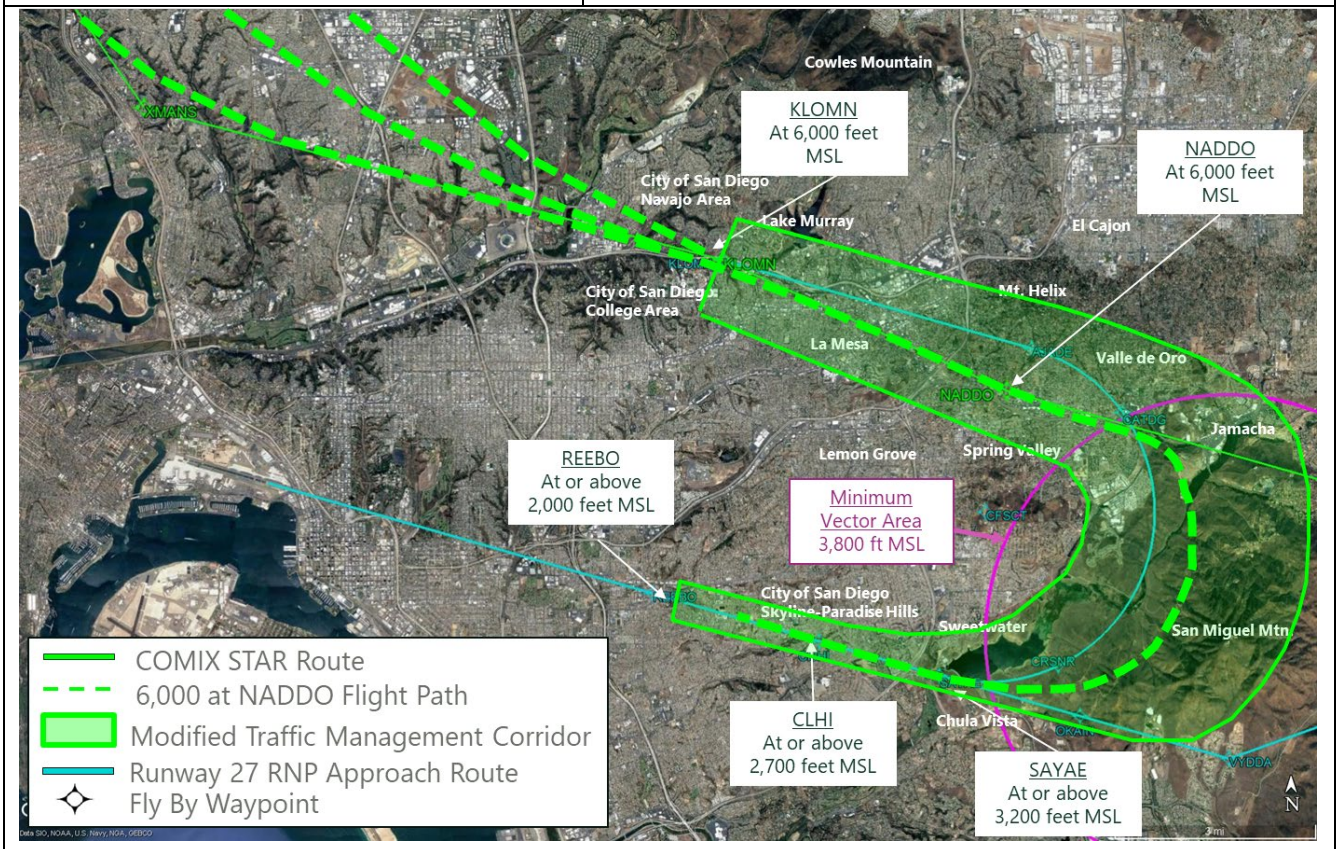
TABLE OF CONTENTS

APPENDIX C DESIGN CONCEPT DESCRIPTIONS

C.1 PRELIMINARY DRAFT DESIGN CONCEPT PHASE ALTERNATIVES

C.1.1 COMIX RNAV STAR - KEEP ALL JET ARRIVALS AT 6,000 FT UP TO NADDO WAYPOINT

ECWG RECOMMENDATION:	COMIX RNAV STAR – KEEP ALL JET ARRIVALS AT 6,000 FT UP TO NADDO
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Day and Nighttime Operations
Version:	Preliminary Draft
Description:	This alternative involves keeping all jet arrivals on the existing COMIX Area Navigation (RNAV) Standard Terminal Arrival Route (STAR) at 6,000 Mean Sea Level (MSL) up to the NADDO waypoint.
Intent:	Keep all jet arrivals at 6,000 ft. MSL to the NADDO waypoint
Version Notes:	Version 1 (initial version of the alternative)



Graphic Source: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 f6,000 ft. at NADDO flight path; modified traffic management corridor).
Graphic Reference: Presented to East County Working Group Meeting #1 on December 6, 2018 and Meeting #3 on May 28, 2019

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 DNL Influence ☒ ECWG Objective ☐ Charting Requirements ☐ Design Criteria ☐ Safety

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility

Design Notes:

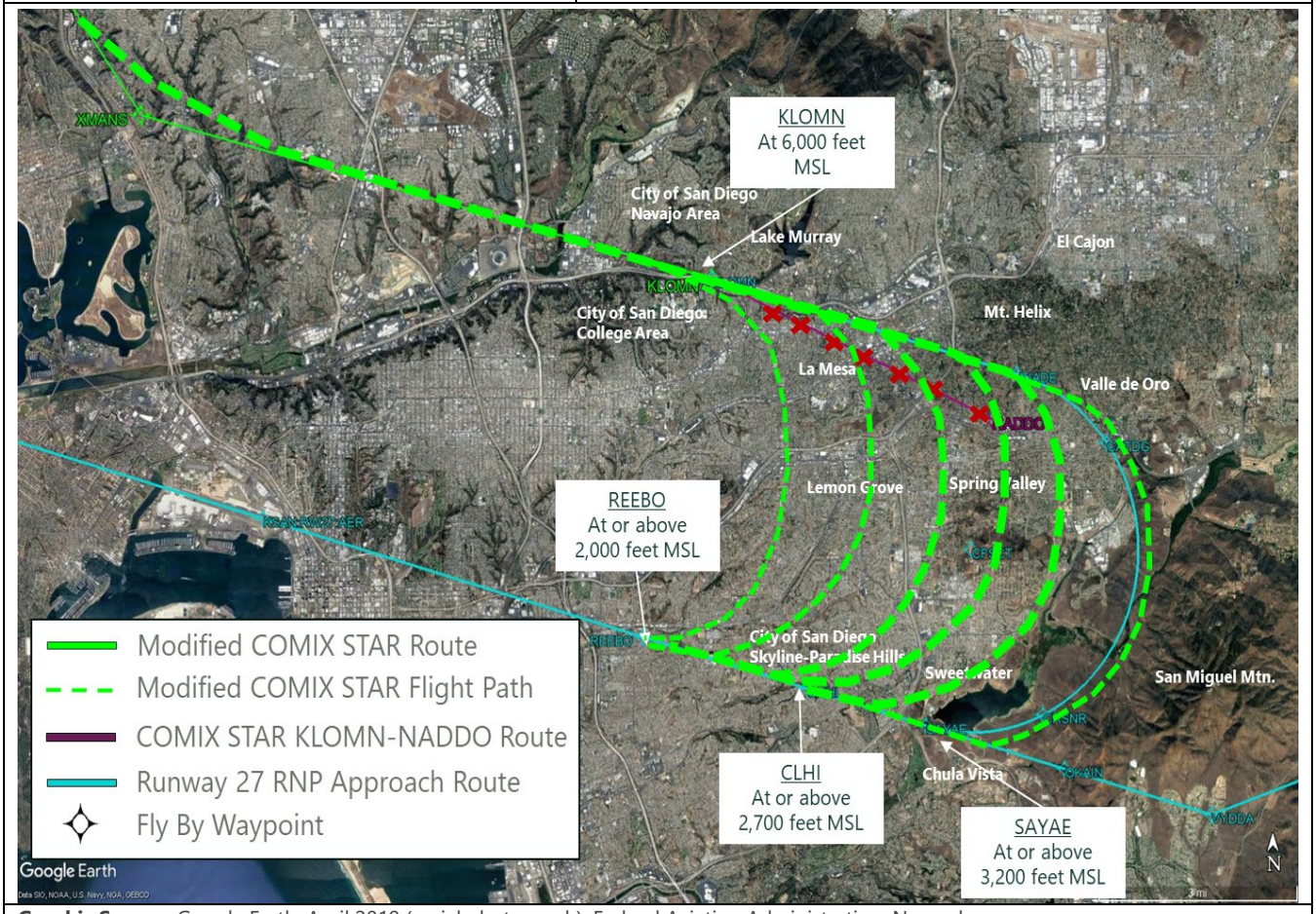
- Predicated on the existing COMIX TWO RNAV STAR procedure
- The design involves increased use of the COMIX TWO RNAV STAR procedure to stay at or above 6,000 ft. MSL between KLOMN and NADDO waypoints.
- Keeping all jet arrivals at or above 6,000 ft. MSL reduces flexibility of ATC to space and sequence aircraft into the final approach airspace as compared to existing operations
- Concept would require aircraft to proceed further east after NADDO waypoint to get the necessary flight path distance needed to descend and slow down prior to joining the final approach.
- Aircraft may be too high to sequence into the final approach which can increase likelihood of missed approaches
- Concentrates all traffic on the KLOMN to NADDO leg of the RNAV procedure, which is contrary to the East County Working Group (ECWG) objectives.

Summary Narrative:

This design would keep aircraft higher than today but would affect efficient management of aircraft. Some aircraft may have difficulty transitioning from 6,000 feet at NADDO to the final approach and the glideslope intercept due to excessive altitude. The change will result in a continued increase in concentrated flights operating on the existing route between KLOMN and NADDO waypoints. The ECWG preference was to provide dispersion after KLOMN waypoint. An amendment to the COMIX TWO RNAV STAR to remove the leg between KLOMN and NADDO and keep aircraft at 6,000 ft. MSL over KLOMN was preferred by ECWG. Therefore, this alternative was eliminated.

C.1.2 COMIX RNAV STAR AMENDMENT – REMOVE ROUTE BETWEEN KLOMN TO NADDO WAYPOINTS

ECWG RECOMMENDATION:	COMIX RNAV STAR AMENDMENT – REMOVE ROUTE BETWEEN KLOMN TO NADDO WAYPOINTS
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Day and Nighttime Operations
Version:	Preliminary Draft
Description:	This alternative involves amending the existing COMIX RNAV STAR to remove the leg from KLOMN to NADDO
Intent:	Remove the leg between KLOMN and NADDO to promote dispersion, then use of the RNAV Required Navigation Performance (RNP) Z Runway 27 and ATC radar vectors to join final approach after crossing KLOMN at 6,000 ft. MSL
Version Notes:	Version 1 (initial version of the alternative)



Graphic Source: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (modified COMIX STAR concept and flight path).
Graphic Reference: Presented to East County Working Group Meeting #2 on January 24, 2019 and Meeting #3 on May 28, 2019.

Screening Findings:

☒ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps
☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 DNL Influence	☐ ECWG Objective	☐ Charting Requirements	☐ Design Criteria	☐ Safety
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	

Design Notes:

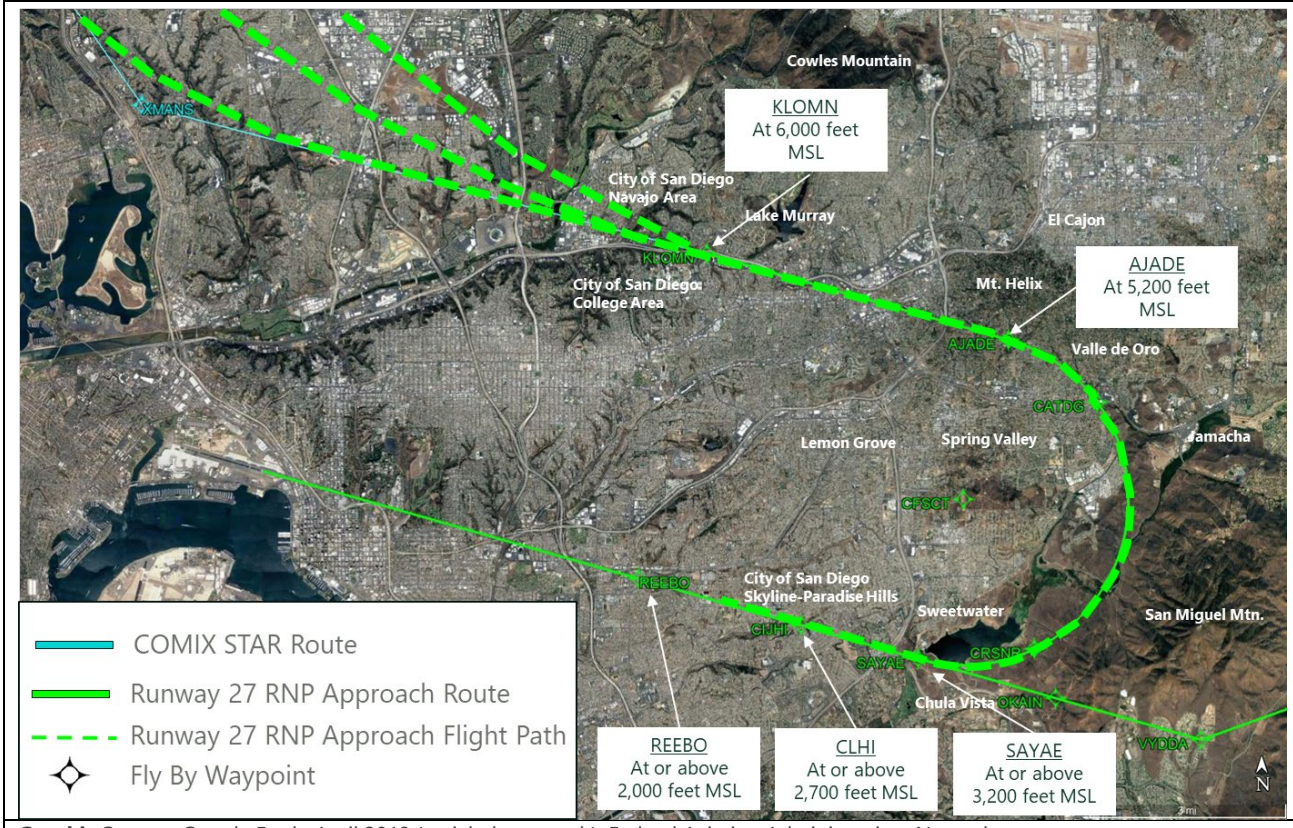
- Predicated on the existing COMIX TWO RNAV STAR
- Involves a charting change (amendment) to the COMIX TWO RNAV STAR
- Procedure is feasible and flyable
- Preserves the flexibility of ATC to space and sequence aircraft into the final approach airspace
- Promotes dispersion of traffic over the East County area
- Maintains the potential use of the RNAV RNP Z Runway 27 Standard Instrument Approach Procedure (SIAP) from the COMIX RNAV STAR
- Eliminates the need for an existing waiver on the existing procedure

Summary Narrative:

The design concept to eliminate the KLOMN to NADDO route calls for aircraft to stay at or above 6,000 ft. MSL at the KLOMN waypoint. The procedure is feasible and flyable. The KLOMN waypoint will become the end of the STAR and is also the Initial Fix for the RNAV RNP Z Runway 27 SIAP. The design also enables ATC to be able to direct movements as needed to sequence the traffic in with arrivals from the east, promoting dispersion. FAA may require the FAA-proposed modification to the Class B airspace be implemented first prior to amending the COMIX RNAV STAR. This design concept to remove the KLOMN to NADDO route was carried forward to the Draft phase.

C.1.3 RUNWAY 27 RNP APPROACH – INCREASE USE

ECWG RECOMMENDATION:	RUNWAY 27 RNP APPROACH – INCREASE USE
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Day and Nighttime Operations
Version:	Preliminary Draft
Description:	The concept involves increasing the use of the existing RNAV RNP Z Runway 27 Standard Instrument Approach Procedure (SIAP)
Intent:	Increase the use of the RNAV RNP Z Runway 27 SIAP to direct more jet arrivals over less populated areas when turning south to join final approach
Version Notes:	Version 1 (initial version of the alternative)



Graphic Source: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (RNP approach flight path).
Graphic Reference: Presented to East County Working Group at Meeting #3 on May 28, 2019

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps
☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 DNL Influence ☒ ECWG Objective ☐ Charting Requirements ☐ Design Criteria ☐ Safety
☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility

Design Notes:

- Alternative is to promote the usage of the existing RNAV RNP Z Runway 27 SIAP.
- Utilizes existing SIAP
- Increased usage would require efforts from the FAA Southern California Terminal Radar Control (SCT TRACON) and airline investment (aircraft equipage and pilot training)
- Reduces aircraft flying the KLOMN to NADDO leg
- Would concentrate more arrivals over areas underneath the RNP flight path, potentially resulting in a concentration of noise

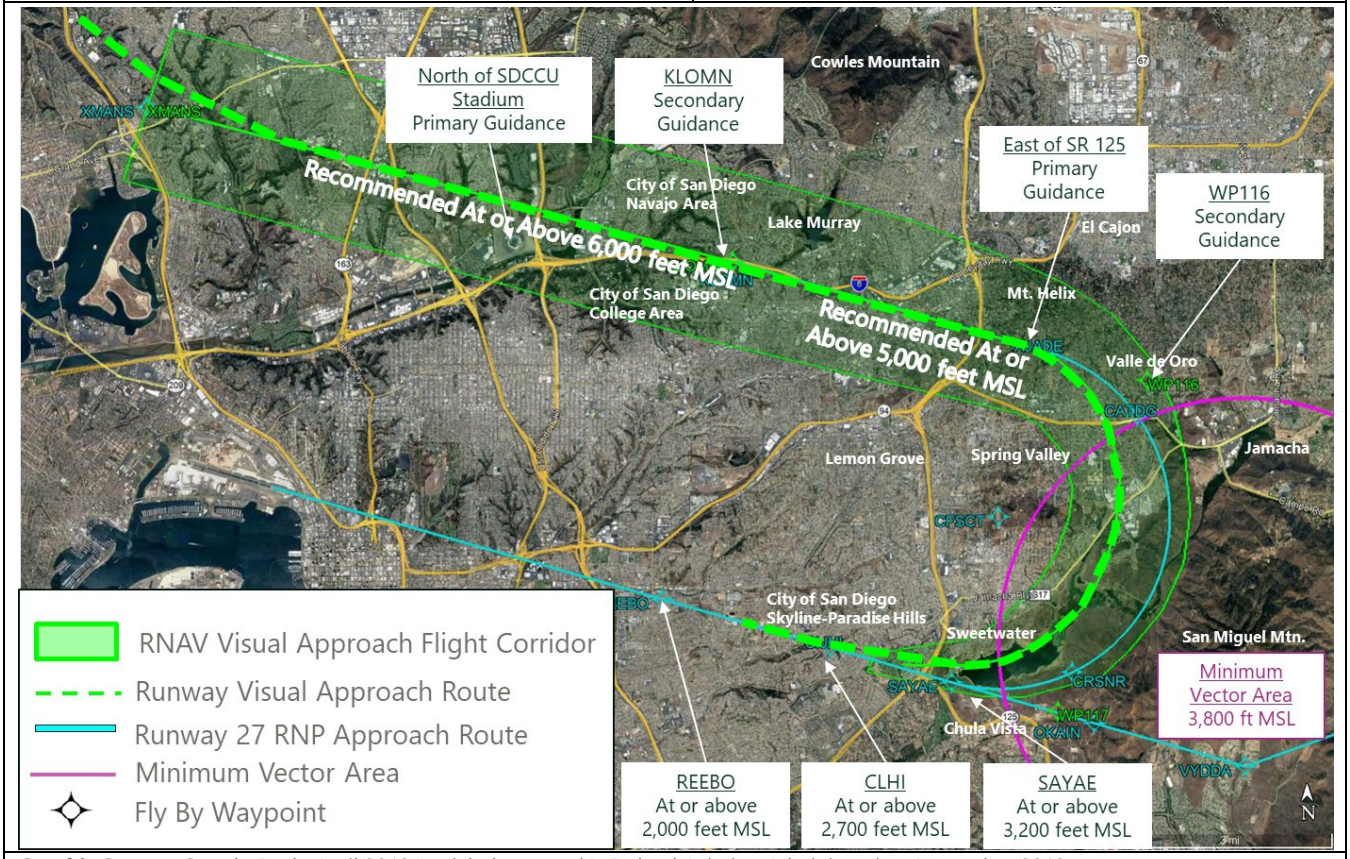
Summary Narrative:

The intent of his alternative was to promote the increased use of the existing RNAV RNP Z Runway 27 SIAP at SAN. Increasing the usage would involve efforts from the SCT TRACON and airlines. SCT controllers would need to assign the procedure and position aircraft arriving on the COMIX TWO STAR at the proper altitudes to enable pilots to accept the procedure and fly it properly. Airlines would need to equip their aircraft with the proper avionics to be eligible for the procedure, and train and certify their flight crews to fly the RNP approach. Pilots would also need to request and/or accept the procedure when operating at SAN.

Increasing the use of the procedure will reduce the amount of traffic flying the leg from KLOMN to NADDO. However, it will increase the traffic along the route of the RNP procedure. Through discussions at the ECWG meetings, members indicated use of the RNAV RNP Z Runway 27 RNP SIAP is useful in providing some respite but did not support the increases use of the procedure as the primary approach for jet arrivals from the northwest due to concentration effects on noise. Therefore, the alternative was eliminated.

C.1.4 RUNWAY 27 RNAV VISUAL APPROACH

ECWG RECOMMENDATION:	RUNWAY 27 RNAV VISUAL APPROACH
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Day and Nighttime Operations
Version:	Preliminary Draft
Description:	The concept involves incorporating RNAV guidance into the Sweetwater Visual Runway 27
Intent:	Reduce noise levels by locating arrivals over more compatible areas with some dispersion and directs more jet arrivals over less populated areas when turning south to join final approach
Version Notes:	Version 1 (initial version of the alternative)



Graphic Source: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (RNAV Visual approach concept route and corridor).
Graphic Reference: Presented to ECWG at Meeting #3 on May 28, 2019

Screening Findings:

- ☐ Pass to Draft
- ☐ Pass to Final
- ☐ Pass to Next Steps
- ☐ Pass to Part 150
- ☒ Eliminate

Reason for Elimination:

- ☐ 65 DNL Influence
- ☒ ECWG Objective
- ☐ Charting Requirements
- ☐ Design Criteria
- ☐ Safety
- ☐ Existing Compliance
- ☐ Not Applicable
- ☐ Noise Impact
- ☐ Operational Feasibility

Design Notes:

- Requires the incorporation of an RNAV approach path using the path into the Sweetwater Visual Runway 27 procedure
- Requires pilots to fly visual increasing workload. Pilots will be required to request approach. FAA may not be able to accommodate visual approach during peak arrival demand periods
- Increase in procedure usage is unlikely
- Path in space is not optimal

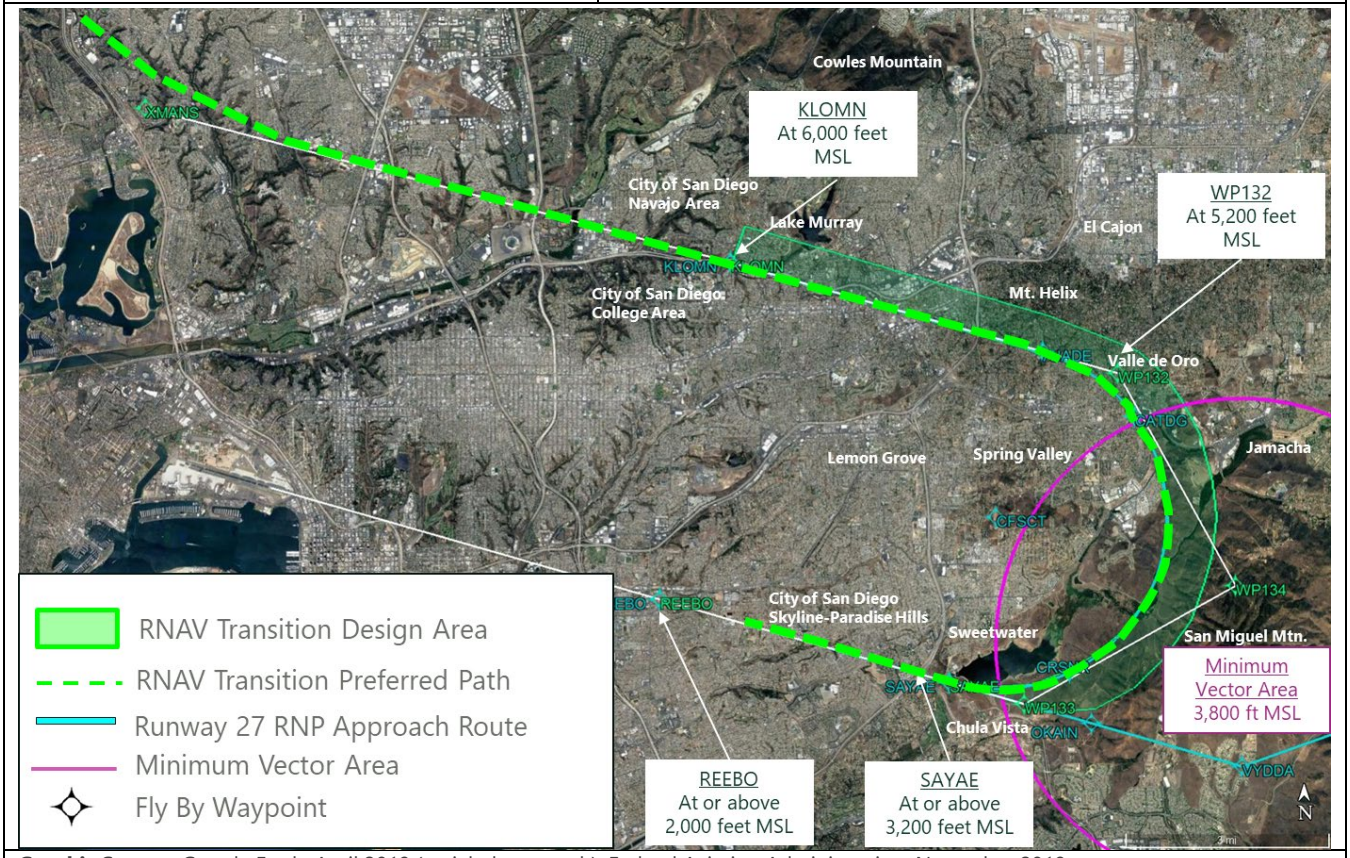
Summary Narrative:

RNAV components can be designed into Chart Visual procedures. However, the primary source of navigation must be ground-based visual markers. As stated by an ECWG member who is an airline pilot, visual approaches require pilot to take responsibility of traffic separation, terrain clearance and staying within the confines of the Class B airspace while calculating how best to get on the proper descent profile. This increases the pilot workload. Visual approaches also have a higher potential for instability as descent rates may vary from segment to segment. For this reason, pilots prefer RNAV-based approach procedures.

During the May ECWG meeting it was also discussed that the path in space may not be optimal. A member suggested evaluating an RNAV approach that would direct aircraft further east and turn south over less populated areas. The procedure would keep aircraft higher compared to current patterns and fly over less populated areas as aircraft descend to a lower altitude to join the final approach. As a result of this suggestion and concerns related to pilot workload and expected infrequent use of a visual approach, this alternative was eliminated and an effort to develop an RNAV transition from the west joining the current RNAV GPS Y Runway 27 Standard Instrument Approach Procedure further east was established in the Draft design phase.

C.1.5 RUNWAY 27 RNAV APPROACH (OVERLAY OF RUNWAY 27 RNP APPROACH)

ECWG RECOMMENDATION:	RUNWAY 27 RNAV GPS APPROACH (OVERLAY OF RUNWAY 27 RNP APPROACH)
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Day and Nighttime Operations
Version:	Preliminary Draft
Description:	Reduce noise levels by locating arrivals over more compatible areas
Intent:	Provide RNAV Global Positioning Satellite (GPS) runway transition that mimics RNAV RNP Z Runway 27 Standard Instrument Approach Procedure (SIAP) and does not require additional navigation equipment and pilot authorization. Directs more jet arrivals over less populated areas when turning south to join final approach
Version Notes:	Version 1 (initial version of the alternative)



Graphic Source: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (Runway 27 RNP Approach route; Minimum Vector Area): Ricondo & Associates, Inc., April 2019 (RNAV Runway 27 approach concept flight path).
Graphic Reference: Presented to ECWG at Meeting #3 on May 28, 2019

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps
☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 DNL Influence	☒ ECWG Objective	☐ Charting Requirements	☐ Design Criteria	☐ Safety
☐ Existing Compliance	☐ Not Applicable	☐ Noise Impact	☐ Operational Feasibility	

Design Notes:

- Procedure is feasible and flyable
- Further performance analysis is required by users
- Concentrates all traffic on the route of the procedure, potentially resulting in a concentration of noise

Summary Narrative:

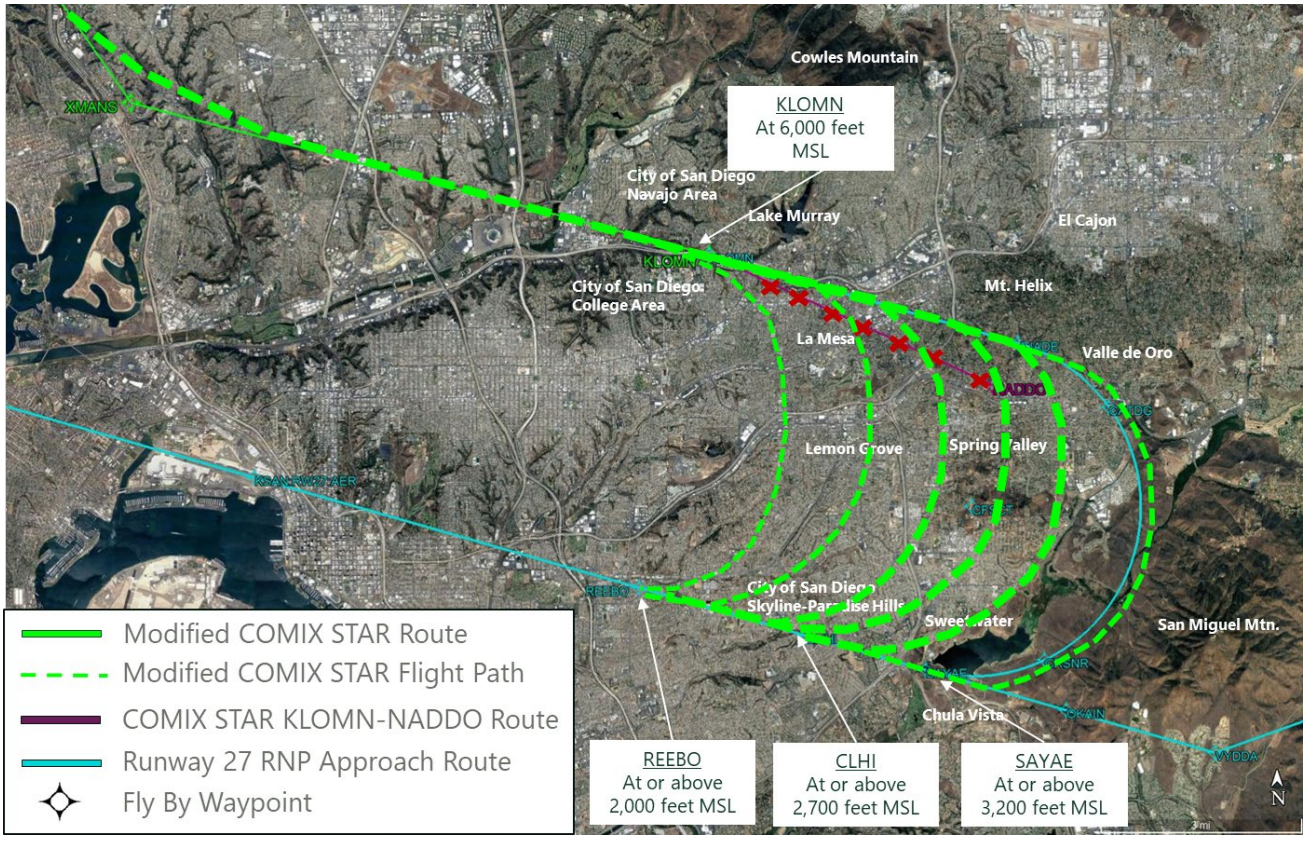
This alternative involves the development of an RNAV GPS SIAP based on the existing RNAV RNP Runway 27 SIAP design for traffic arriving from the west on the COMIX TWO. RNAV approaches differ from RNP approaches in their construction and do not require the additional aircraft and aircrew certification. The existing RNP procedure utilizes a Radius to a Fix Leg creating a curved circular path from the downwind on to the final approach. The RNAV procedure mimics this path by using 45 degree, 90 degree, 45 degree Track to Fix Legs in succession and by adjusting the aircraft speed to enable aircraft flyability. The conceptual RNAV GPS SIAP is feasible and flyable and connects into the existing RNAV GPS Y Runway 27 SIAP.

Most aircraft (over 90 percent) operating at SAN are capable of flying an RNAV GPS SIAP. Therefore, the use of the procedure would likely be much higher than the RNAV RNP Z Runway 27 SIAP. Increasing the use of the procedure will reduce the amount of traffic flying the leg from KLOMN to NADDO. However, it will increase the traffic along the route of the procedure. Through discussions at the ECWG meetings, members indicated they want to encourage dispersion and did not support the use of the path in space of the existing RNAV RNP Z Runway 27 or the proposed RNAV GPS Runway 27 procedure as the primary approach for jet arrivals from the northwest due to the concentration effect on noise. Therefore, the alternative was eliminated. A member of the ECWG suggested a related alternative involving the development of an RNAV GPS approach that goes further east before turning back on to the final approach during low demand periods. This alternative was forwarded to the Draft phase and is discussed in the next section.

C.2 DRAFT DESIGN CONCEPT PHASE ALTERNATIVES

C.2.1 MODIFICATION TO COMIX RNAV STAR – REMOVE ROUTE BETWEEN KLOMN AND NADDO WAYPOINT AND KEEP JET ARRIVALS AT 6,000 FT. MSL AT KLOMN

ECWG RECOMMENDATION:	MODFICATOIN TO COMIX RNAV STAR – REMOVE ROUTE BETWEEN KLOMN AND NADDO WAYPOINT AND KEEP JET ARRIVALS AT 6,000 FT. MSL AT KLOMN
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Day and Nighttime Operations
Version:	Draft
Description:	This alternative involves amending the existing COMIX RNAV STAR to remove the leg from KLOMN to NADDO
Intent:	Remove the leg between KLOMN and NADDO to promote dispersion after KLOMN waypoint and keep aircraft at 6,000 ft. at KLOMN waypoint
Version Notes:	Version 1 (initial version of the alternative)



Graphic Source: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (modified COMIX STAR concept and flight path).
Graphic Reference: Presented to East County Working Group at Meeting #4 on July 25, 2019.

Screening Findings:

☐ Pass to Draft ☒ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 DNL Influence ☐ ECWG Objective ☐ Charting Requirements ☐ Design Criteria ☐ Safety

☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility

Design Notes:

- Predicated on the existing COMIX TWO RNAV STAR
- Involves a simple charting change (amendment) to the COMIX TWO RNAV STAR
- Procedure is feasible and flyable
- Preserves the flexibility of ATC to space and sequence aircraft into the final approach airspace
- Promotes dispersion of traffic in the area
- Maintains the potential use of the RNAV RNP Z Runway 27 Standard Instrument Approach Procedure (SIAP) from the COMIX RNAV STAR
- Eliminates the need for an existing waiver on the existing procedure

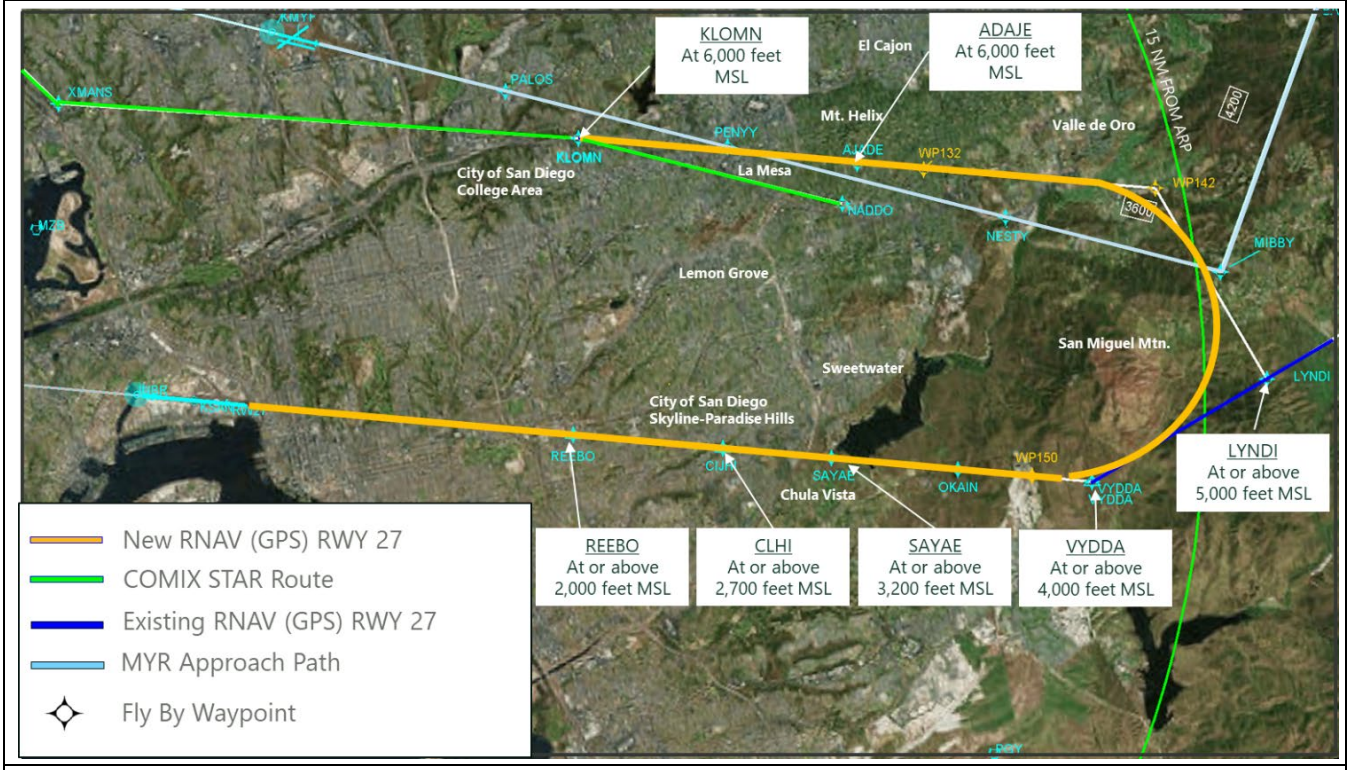
Summary Narrative:

This design concept to remove the KLOMN to NADDO route was carried forward from the Preliminary Draft phase. No changes were made from the preliminary draft version. The design concept to eliminate the KLOMN to NADDO route calls for aircraft to stay at or above 6,000 ft. MSL at the KLOMN waypoint. The procedure is feasible and flyable. The KLOMN waypoint will become the end of the Standard Terminal Arrival Route and is also the Initial Fix for the RNP Runway 27 Standard Instrument Approach Procedure (SIAP). The design also enables Air Traffic Controllers to be able vector and sequence the traffic in with arrivals from the east, promoting dispersion.

Based on discussions with the FAA, the leg from KLOMN to NADDO was added as a temporary fix to solve a condition where aircraft were exiting the Class B airspace. The intent of the leg was to provide positive guidance that enables aircraft to remain inside the Class B airspace. The design is non-standard and requires a waiver because the STAR does not end at the same initial approach fix where the Runway 27 RNP approach begins. The FAA has proposed changes to the Class B airspace to solve the aircraft excursion problem. If the Class B changes occur, there should no longer be a need for the leg and an amendment of the procedure to remove the leg would be likely. It may be possible to have the procedure amended prior to a Class B change at the discretion of the FAA. Based on these factors, the procedure amendment was recommended to be forwarded to the final analysis phase of the project.

C.2.2 RUNWAY 27 APPROACH – EXTEND APPROACH EAST AND JOIN AT VYDAA WAYPOINT (11:00 P.M. TO 7:00 A.M.)

ECWG RECOMMENDATION:	RUNWAY 27 APPROACH – APPROACH EAST AND JOIN AT VYDAA WAYPOINT
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (11:00 p.m. to 7:00 a.m.) Arrivals
Version:	Draft
Description:	The concept involves the development of an RNAV approach procedure from the west that transitions into the existing RNAV Runway 27 Standard Instrument Approach Procedure (SIAP) at the VYDDA waypoint.
Intent:	Keep nighttime arrivals (low demand period) higher across the east county area and turn south to join final over less populated area
Version Notes:	Version 1 (initial version of the alternative)



Graphic Source: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Montgomery Field approach procedure, existing Runway 27 RNAV (GPS) approach); Ricondo & Associates, Inc., July 2019 (Runway 27 RNAV (GPS) approach).
Graphic Reference: Presented to East County Working Group at Meeting #4 on July 25, 2019.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps
☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 DNL Influence ☐ ECWG Objective ☐ Charting Requirements ☒ Design Criteria ☐ Safety
☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility

Design Notes:

- Keeps aircraft higher over the east San Diego County area
- Procedure is flyable
- Procedure design connects to the existing RNAV Runway 27 SIAP seamlessly
- New path increases miles flown by 7.75 nautical miles as compared to the RNAV RNP Z Runway 27 SIAP
- Conflicts with approach to Montgomery Field Runway 28R approaches and jet arrivals on the LUCKI RNAV STAR
- Merges with routes from the east at a common point potentially limiting capacity
- Requires a waiver because the intermediate segment is longer that 15 nautical miles and is more than 15 nautical miles from the Airport Reference Point – waiver makes the procedure not feasible for purposes of this flight procedure evaluation

Summary Narrative:

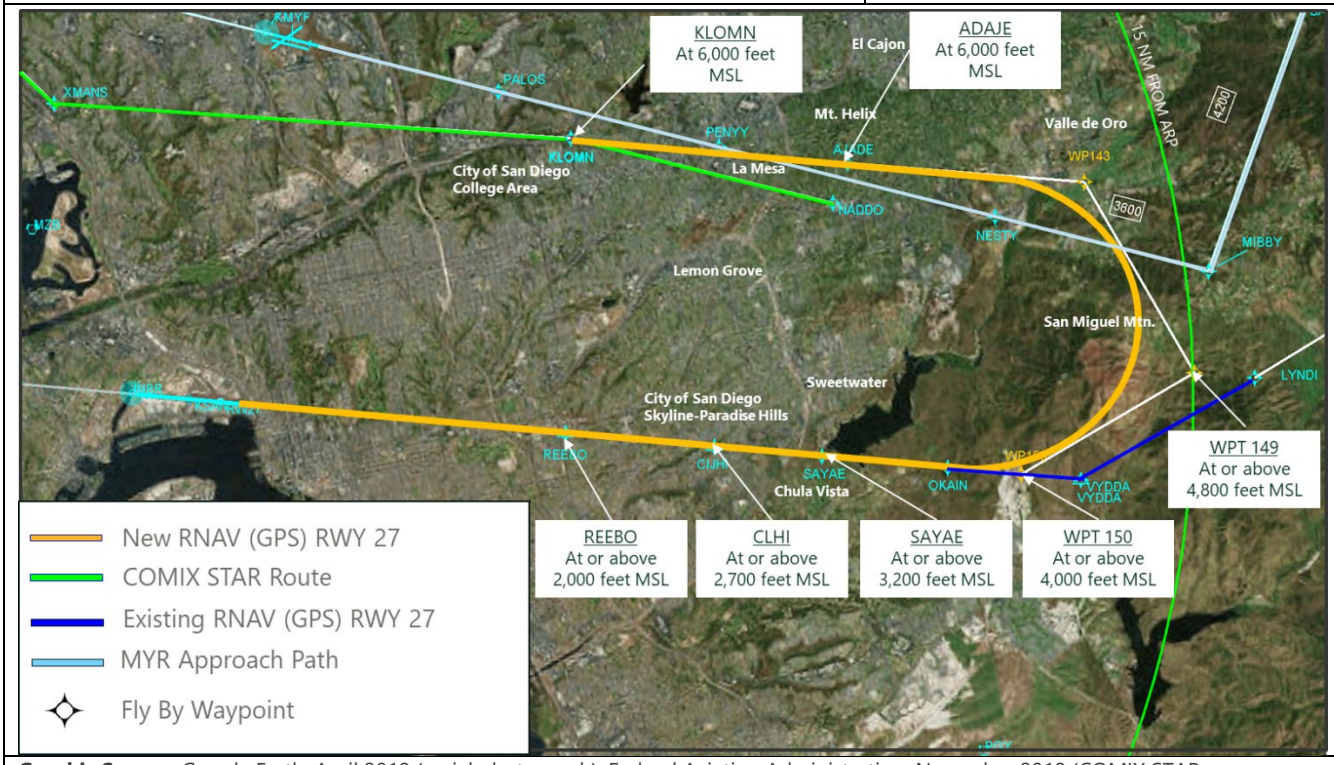
This alternative was derived from ECWG discussions of the Runway 27 RNAV visual approach alternative. The intent of the alternative was to keep aircraft higher across east San Diego County area and sequence aircraft to join the existing RNAV GPS Y Runway 27 SIAP.

The conceptual alternative is flyable and connects seamlessly to the existing RNAV GPS Y Runway 27 SIAP resulting in the exact same flight profile and minimums but requires a waiver because the intermediate segment is longer that 15 nautical miles. The flight miles increase by 7.75 nautical miles with this design as compared to the RNAV RNP Z Runway 27 SIAP and the extended downwind leg presents potential conflicts with the Runway 28R approaches at Montgomery-Gibbs Executive Airport (MYF) and traffic arriving from the east on the LUCKI RNAV STAR. These constraints were discussed at the ECWG meetings in May and July of 2019 and the alternative was limited to nighttime operations only to mitigate the potential conflicts with MYF and traffic arriving from the east and the impact to efficiency if all arrivals were to be assigned the concept.

The intermediate segment was extended to over 17 nautical miles in length in order to make the procedure connect to the existing RNAV GPS Y Runway 27 SIAP. SIAP designs with intermediate segments longer than 15 nautical miles that are more than 15 nautical miles from the Airport Reference Point are considered non-standard and require a waiver from FAA. Because a waiver would be required for this design, it was eliminated from consideration. A modified version (Extend Approach East and Join Near VYDAA Waypoint) was developed that strives to meet the intent and not require a waiver.

C.2.3 RUNWAY 27 APPROACH – EXTEND APPROACH EAST AND JOIN NEAR VYDAA WAYPOINT (11:00 P.M. TO 7:00 A.M.)

ECWG RECOMMENDATION:	RUNWAY 27 APPROACH – EXTEND APPROACH EAST AND JOIN NEAR VYDAA WAYPOINT
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (11:00 p.m. to 7:00 a.m.) Arrivals
Version:	Draft
Description:	The concept involves the development of an RNAV procedure from the west that transitions into the existing RNAV Runway 27 Standard Instrument Approach Procedure (SIAP) at the VYDDA waypoint
Intent:	Keep nighttime arrivals (low demand period) higher across the east county area and turn south to join final over less populated area
Version Notes:	Version 2



Graphic Source: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Montgomery Field approach procedure, existing Runway 27 RNAV (GPS) approach); Ricondo & Associates, Inc., July 2019 (Runway 27 RNAV (GPS) approach).
Graphic Reference: Presented to East County Working Group at Meeting #4 on July 25, 2019.

Screening Findings:

☐ Pass to Draft ☒ Pass to Final ☐ Pass to Next Steps
☐ Pass to Part 150 ☐ Eliminate

Reason for Elimination:

☐ 65 DNL Influence ☐ ECWG Objective ☐ Charting Requirements ☐ Design Criteria ☐ Safety
☐ Existing Compliance ☐ Not Applicable ☐ Noise Impact ☐ Operational Feasibility

Design Notes:

- Keeps aircraft higher over east San Diego County area
- Procedure is feasible and flyable
- Procedure design connects to the existing RNAV Runway 27 SIAP closer to the airport than Version 1
- New path increases miles flown by 6 nautical miles as compared to the RNAV RNP Z Runway 27 SIAP
- Conflicts with approach to Montgomery Field Runway 28R approaches
- No waiver is required

Summary Narrative:

This alternative was derived from the previous alternative. The intent of this version was to keep aircraft higher across east San Diego County area, turn aircraft south over less-populated areas, and sequence aircraft to join the existing RNAV GPS Y Runway 27 SIAP using a design that does not require a waiver to standards. This would be applicable during low arrival demand periods, specifically between 11:00 p.m. to 07:00 a.m.

The version 2 conceptual alternative is feasible and flyable and connects to the existing RNAV GPS Y Runway 27 SIAP resulting in a similar flight profile and minimums compared to version 1. The flight miles increase by 6 nautical miles with this design as compared to the RNAV RNP Z Runway 27 SIAP. The procedure is intended for nighttime use due to potential conflicts with the Runway 28R approaches at Montgomery-Gibbs Executive Airport (MYF) and traffic arriving from the east on the LUCKI RNAV STAR.

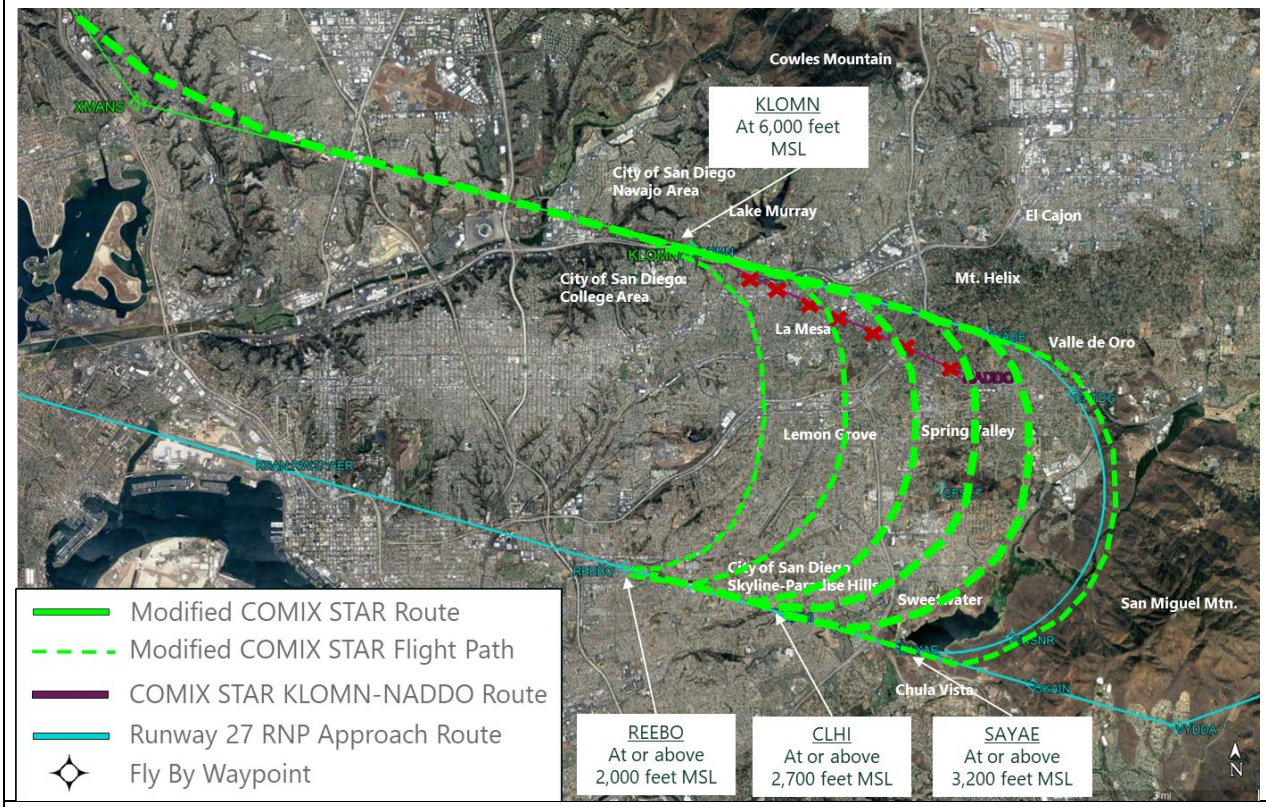
The intermediate segment is more than 15 nautical miles in length in order to make the procedure connect to the existing RNAV GPS Y Runway 27 SIAP but the segment is within 15 nautical miles of the Airport. Therefore, a waiver is not required. The design was intended to keep aircraft as far east as possible. Adjustments could be made to the west to create a slightly better intermediate descent profile.

This alternative was agreeable to the ECWG members and was discussed with FAA. FAA did not indicate fatal flaws with the procedure, therefore was recommended to be forwarded to the final phase of the analysis.

C.3 FINAL DESIGN CONCEPT PHASE ALTERNATIVES

C.3.1 MODIFICATION TO COMIX RNAV STAR – REMOVE ROUTE BETWEEN KLOMN AND NADDO WAYPOINT AND KEEP JET ARRIVALS AT 6,000 FT. MSL AT KLOMN

ECWG RECOMMENDATION:	MODFICATOIN TO COMIX RNAV STAR – REMOVE ROUTE BETWEEN KLOMN AND NADDO WAYPOINT AND KEEP JET ARRIVALS AT 6,000 FT. MSL AT KLOMN
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Day and Nighttime Operations
Version:	Final
Description:	This alternative involves amending the existing COMIX RNAV STAR to remove the leg from KLOMN to NADDO
Intent:	Remove the leg between KLOMN and NADDO to promote dispersion after KLOMN waypoint and keep aircraft at 6,000 ft. at KLOMN waypoint
Version Notes:	Version 1 (initial version of the alternative)



Graphic Source: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (modified COMIX STAR concept and flight path).
Graphic Reference: Presented to East County Working Group at Meeting #4 on July 25, 2019.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps

☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 DNL Influence	☐ ECWG Objective	☐ Charting Requirements	☐ Design Criteria	☐ Safety
☐ Existing Compliance	☐ Not Applicable	☒ Noise Impact	☐ Operational Feasibility	

Design Notes:

- Predicated on the existing COMIX TWO RNAV STAR
- Involves a simple charting change (amendment) to the COMIX TWO RNAV STAR
- Procedure is feasible and flyable
- Preserves the flexibility of ATC to space and sequence aircraft into the final approach airspace
- Promotes dispersion of traffic in the area
- Maintains the potential use of the RNAV RNP Z Runway 27 Standard Instrument Approach Procedure (SIAP) from the COMIX RNAV STAR
- Eliminates the need for an existing waiver on the existing procedure

Summary Narrative:

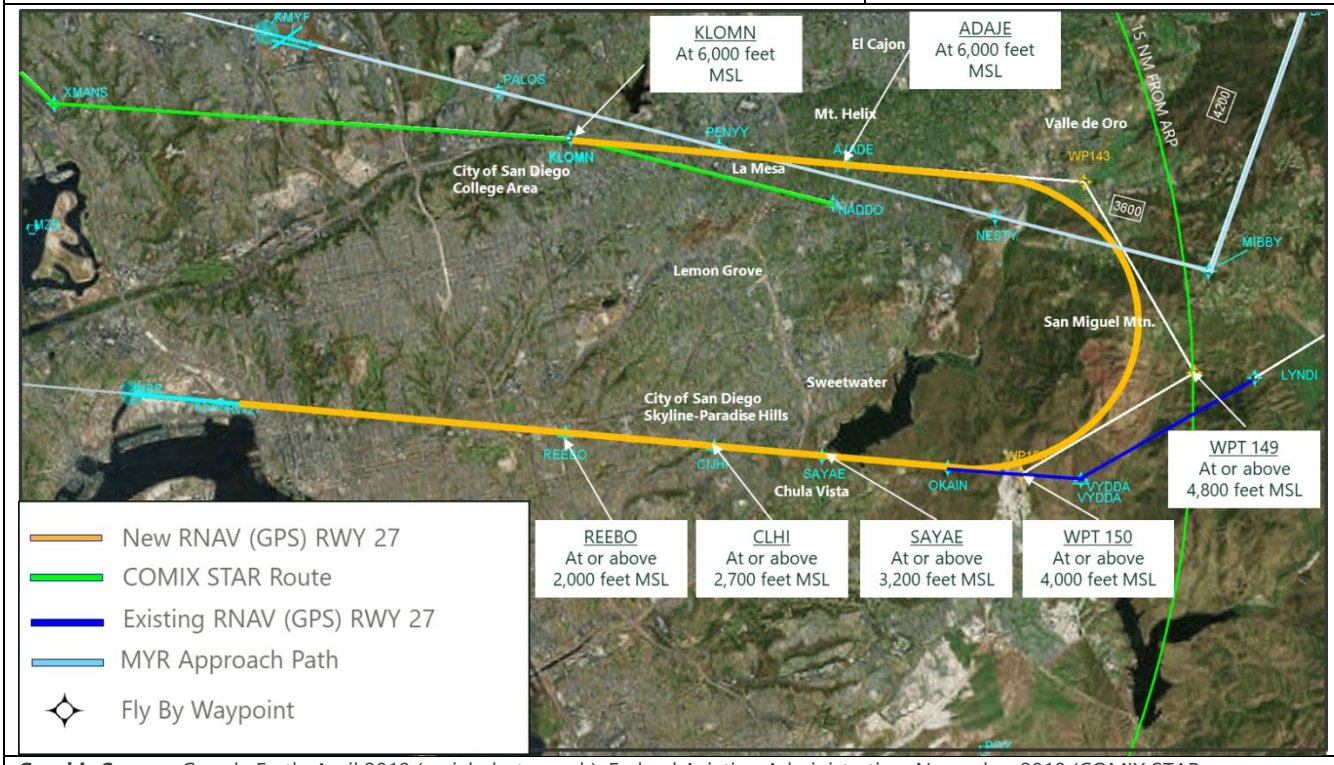
This design concept to remove the KLOMN to NADDO route was carried forward from the Draft phase. No changes were made from the preliminary draft version. The design concept to eliminate the KLOMN to NADDO route calls for aircraft to stay at or above 6,000 ft. MSL at the KLOMN waypoint. The procedure is feasible and flyable. The KLOMN waypoint will become the end of the Standard Terminal Arrival Route and is also the Initial Fix for the RNP Runway 27 Standard Instrument Approach Procedure (SIAP). The design also enables Air Traffic Controllers to be able vector and sequence the traffic in with arrivals from the east, promoting dispersion.

Based on discussions with the FAA, the leg from KLOMN to NADDO was added as a temporary fix to solve a condition where aircraft were exiting the Class B airspace. The intent of the leg was to provide positive guidance that enables aircraft to remain inside the Class B airspace. The design is non-standard and requires a waiver because the STAR does not end at the same initial approach fix where the Runway 27 RNP approach begins. The FAA has proposed changes to the Class B airspace to solve the aircraft excursion problem. If the Class B changes occur, there should no longer be a need for the leg and an amendment of the procedure to remove the leg would be likely. It may be possible to have the procedure amended prior to a Class B change at the discretion of the FAA. Based on these factors, the procedure amendment was recommended to be forwarded to the final analysis phase of the project.

The noise screening analysis indicated a decrease between 2 and 3 dBA CNEL for Spring Valley area and decreases between 1 and 2 dBA CNEL for La Mesa and Lemon Grove area. This decrease is caused by moving jet arrivals from the KLOMN to NADDO route to the proposed flight path that continues east after passing the KLOMN waypoint. As a result of moving traffic east of KLOMN, an increase in CNEL levels between 1 and 2 dBA for the Casa de Oro, Mount Helix and Rancho San Diego community areas. Due to the increase in CNEL levels and based on input provided by ECWG at the December 11, 2019 meeting, this design concept was recommended to be eliminated.

C.3.2 RUNWAY 27 APPROACH – EXTEND APPROACH EAST AND JOIN NEAR VYDAA WAYPOINT (11:00 P.M. TO 7:00 A.M.)

ECWG RECOMMENDATION:	RUNWAY 27 APPROACH – EXTEND APPROACH EAST AND JOIN NEAR VYDAA WAYPOINT
Runway Configuration:	Runway 27 Arrivals and Departure
Operational Mode:	Runway 27 Nighttime (11:00 p.m. to 7:00 a.m.) Arrivals
Version:	Draft
Description:	The concept involves the development of an RNAV procedure from the west that transitions into the existing RNAV Runway 27 Standard Instrument Approach Procedure (SIAP) at the VYDDA waypoint
Intent:	Keep nighttime arrivals (low demand period) higher across the east county area and turn south to join final over less populated area
Version Notes:	Version 2



Graphic Source: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Montgomery Field approach procedure, existing Runway 27 RNAV (GPS) approach); Ricondo & Associates, Inc., July 2019 (Runway 27 RNAV (GPS) approach).
Graphic Reference: Presented to East County Working Group at Meeting #4 on July 25, 2019.

Screening Findings:

☐ Pass to Draft ☐ Pass to Final ☐ Pass to Next Steps
☐ Pass to Part 150 ☒ Eliminate

Reason for Elimination:

☐ 65 DNL Influence ☐ ECWG Objective ☐ Charting Requirements ☐ Design Criteria ☐ Safety
☐ Existing Compliance ☐ Not Applicable ☒ Noise Impact ☐ Operational Feasibility

Design Notes:

- Keeps aircraft higher over east San Diego County area
- Procedure is feasible and flyable
- Procedure design connects to the existing RNAV Runway 27 SIAP closer to the airport than Version 1
- New path increases miles flown by 6 nautical miles as compared to the RNAV RNP Z Runway 27 SIAP
- Conflicts with approach to Montgomery Field Runway 28R approaches
- No waiver is required

Summary Narrative:

This design concept was carried forward from the Draft phase. No changes were made from the preliminary draft version. The intent of this version was to keep aircraft higher across east San Diego County area, turn aircraft south over less-populated areas, and sequence aircraft to join the existing RNAV GPS Y Runway 27 SIAP using a design that does not require a waiver to standards. This would be applicable during low arrival demand periods, specifically between 11:00 p.m. to 07:00 a.m.

The version 2 conceptual alternative is feasible and flyable and connects to the existing RNAV GPS Y Runway 27 SIAP resulting in a similar flight profile and minimums compared to version 1. The flight miles increase by 6 nautical miles with this design as compared to the RNAV RNP Z Runway 27 SIAP. The procedure is intended for nighttime use due to potential conflicts with the Runway 28R approaches at Montgomery-Gibbs Executive Airport (MYF) and traffic arriving from the east on the LUCKI RNAV STAR.

The intermediate segment is more than 15 nautical miles in length in order to make the procedure connect to the existing RNAV GPS Y Runway 27 SIAP but the segment is within 15 nautical miles of the Airport. Therefore, a waiver is not required. The design was intended to keep aircraft as far east as possible. Adjustments could be made to the west to create a slightly better intermediate descent profile.

This alternative was agreeable to the ECWG members and was discussed with FAA. FAA did not indicate fatal flaws with the procedure, therefore was recommended to be forwarded to the final phase of the analysis.

The noise screening analysis indicated a decrease between 2 and 3 dBA CNEL for Spring Valley area and decreases between 1 and 2 dBA CNEL for the Sweetwater community area. This decrease is caused by moving all jet arrivals between 11:00 p.m. and 7:00 a.m. on the proposed Runway 27 RNAV approach that starts at the KLOMN waypoint. Increases in CNEL levels between 3 and 4 dBA for the Steele Canyon community area would occur as a result of moving traffic on the proposed RNAV approach. In additions, increases between 2 and 3 dBA CNEL would occur for the Rancho San Diego community area. Due to the noticeable increase in CNEL levels and based on input provided by ECWG at the December 11, 2019 meeting, this design concept was recommended to be eliminated.