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.

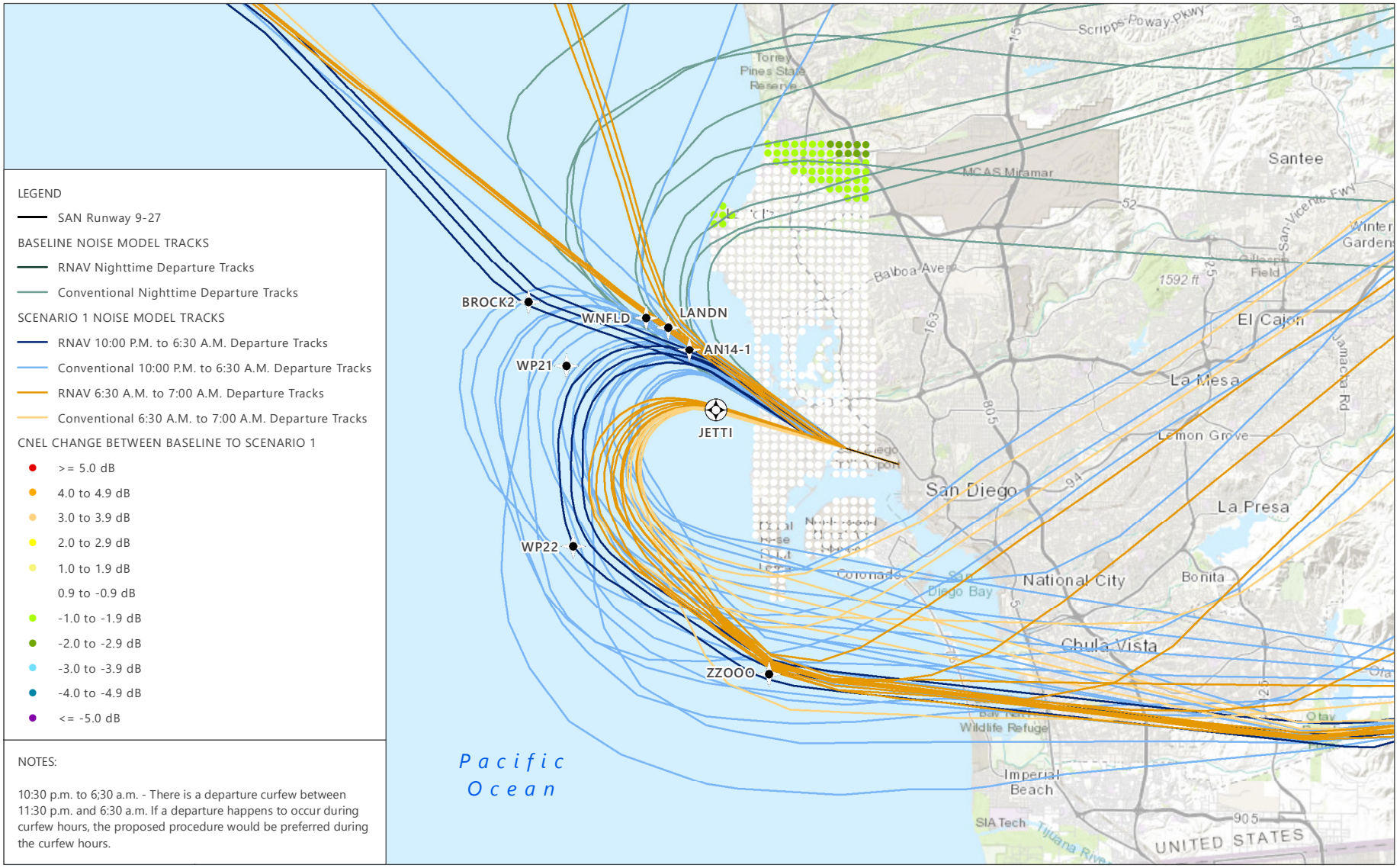
Exhibit 6-1 depicts the baseline and Scenario 1 noise model tracks related to the proposed final design concept with operations between 10:00 p.m. and 6:59 a.m. and the calculated changes equal to or higher than 1 CNEL dBA. The noise model tracks depicted on Exhibit 6-1 indicate expected flight paths 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.

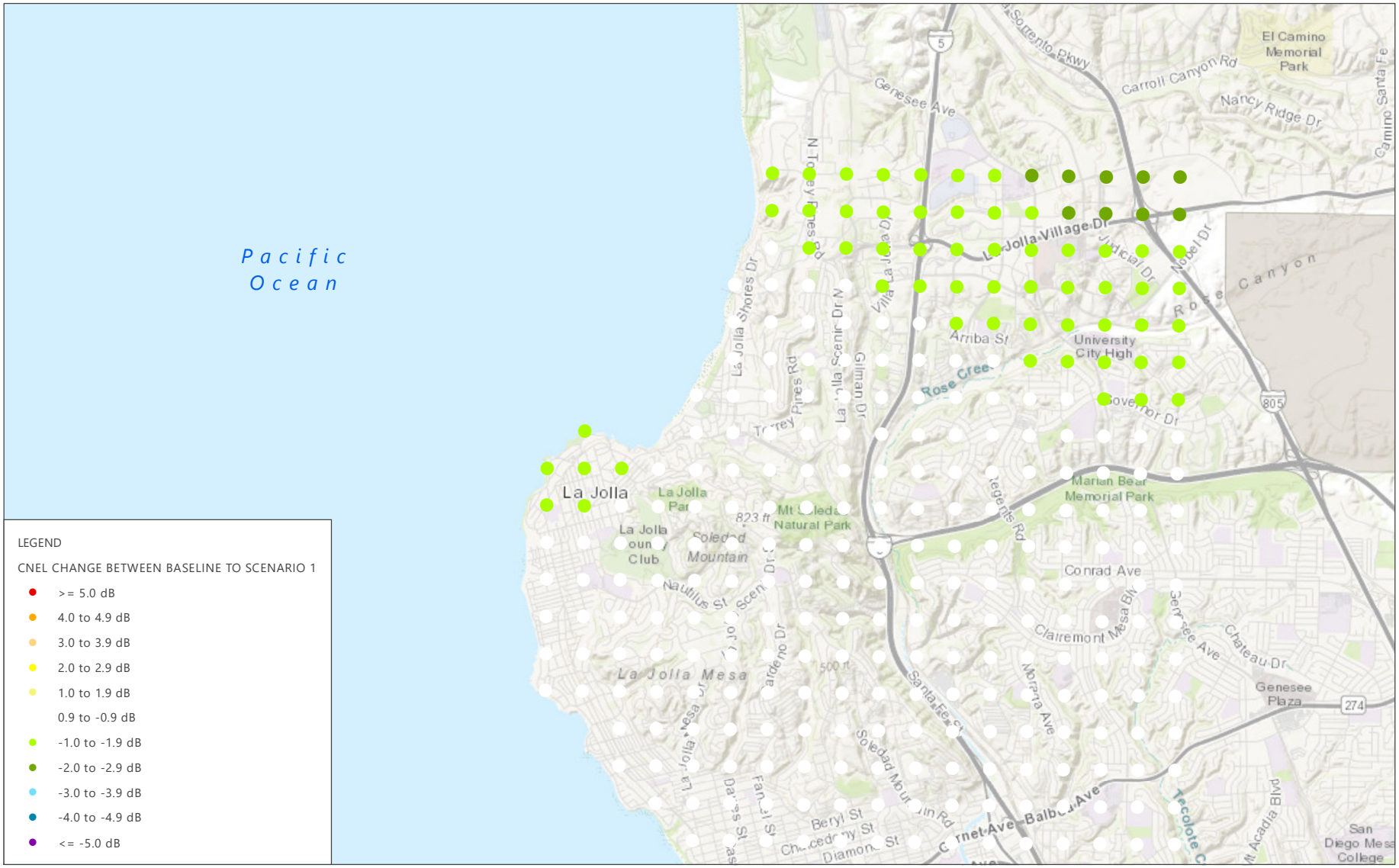


SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (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.

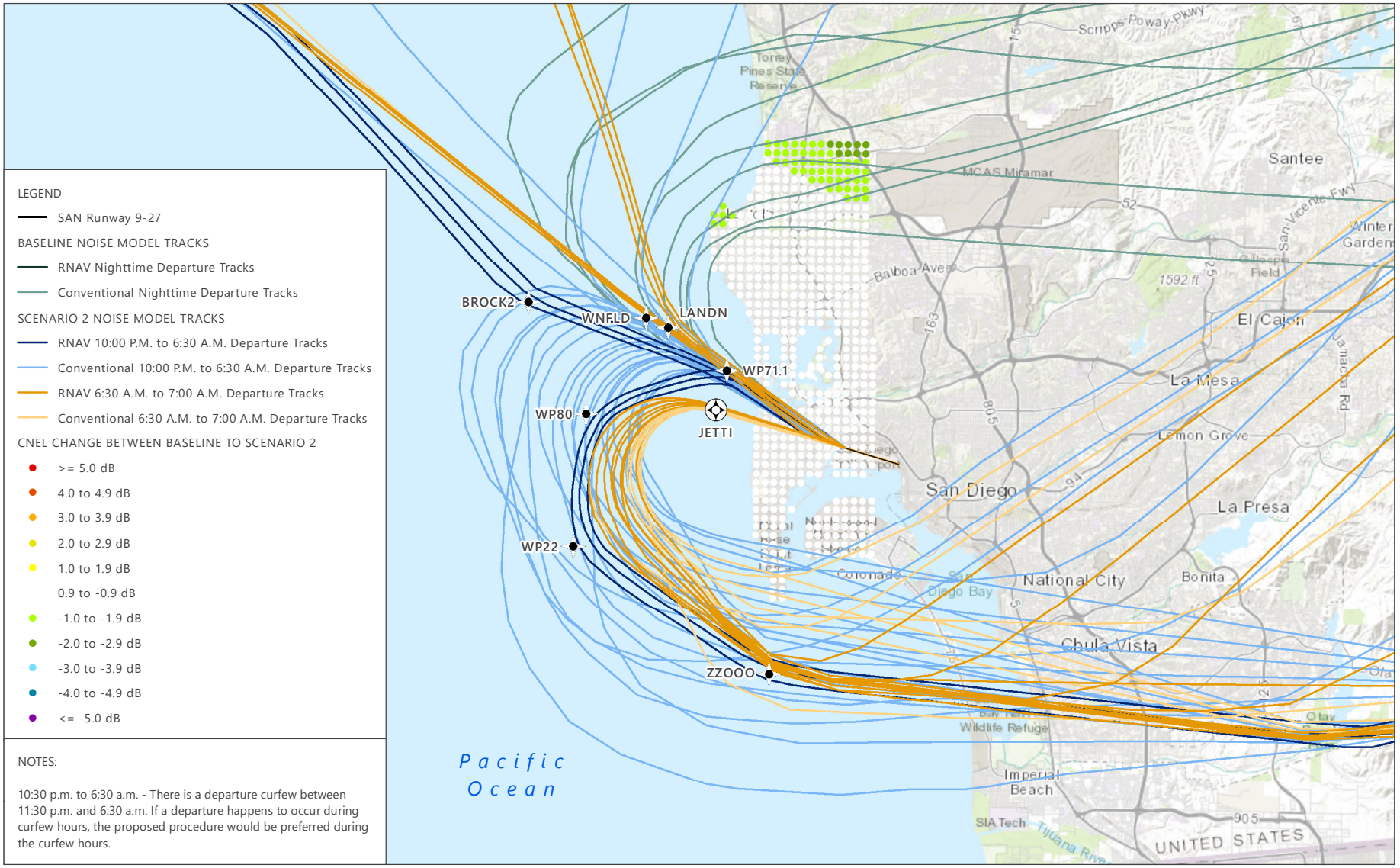
Scenario 1 included the proposed final design concept for ANAC 15 Alternative 2 for departures between 10:00 p.m. and 6:30 a.m. heading to the east towards the ZZOOO waypoint. The change in CNEL levels within the Point Loma area did not exceed 1 CNEL dBA, but there were decreases in CNEL below 1 dBA 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

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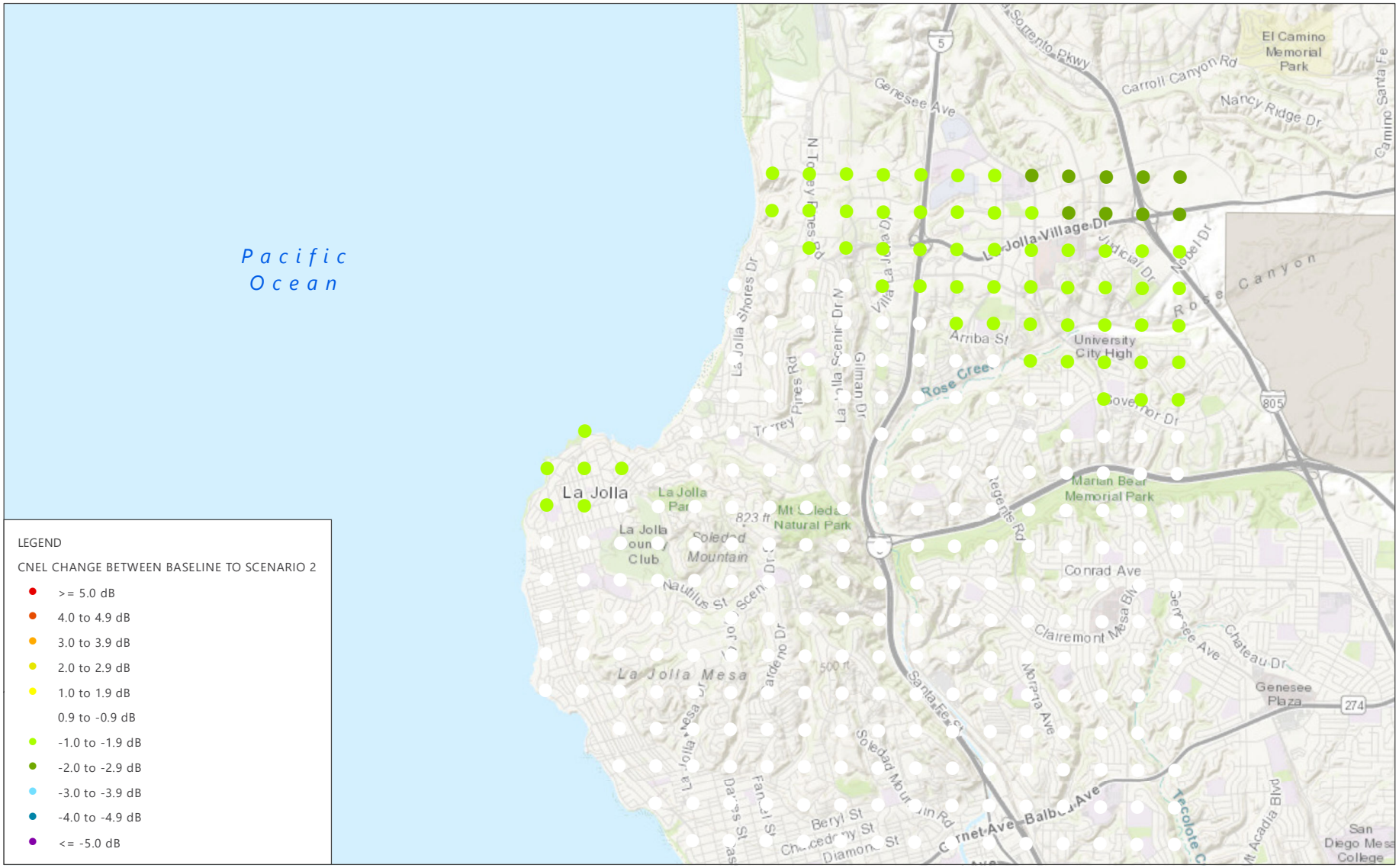


SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (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.

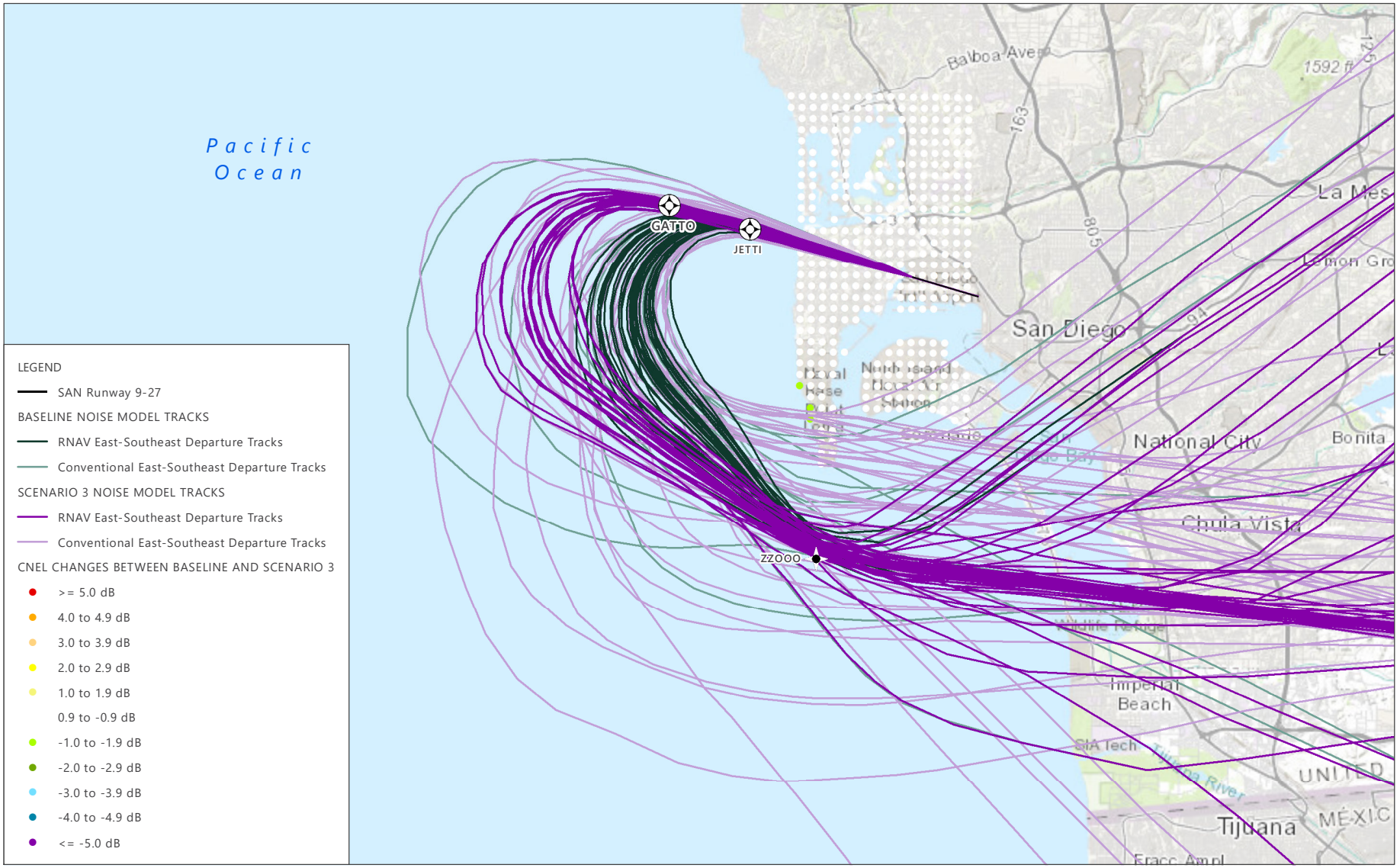
Exhibit 6-5 depicts the baseline noise model tracks, Scenario 3 noise model tracks and calculated changes equal to or higher than 1 CNEL dBA. For clarity purposes, the departure noise model tracks on the initial right turn heading from Runway 27 and arrival noise model tracks from the northwest were 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.

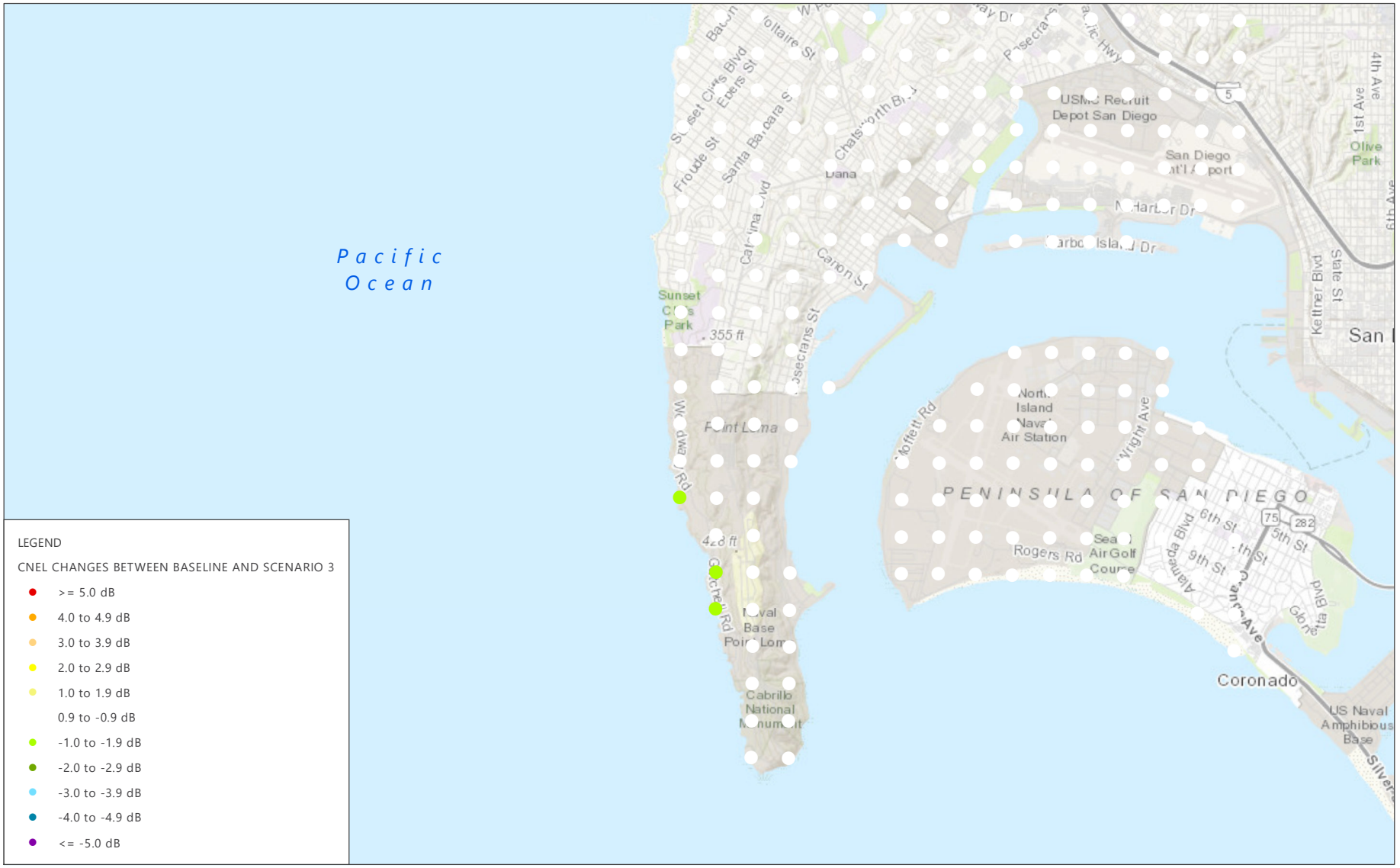


SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (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).

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



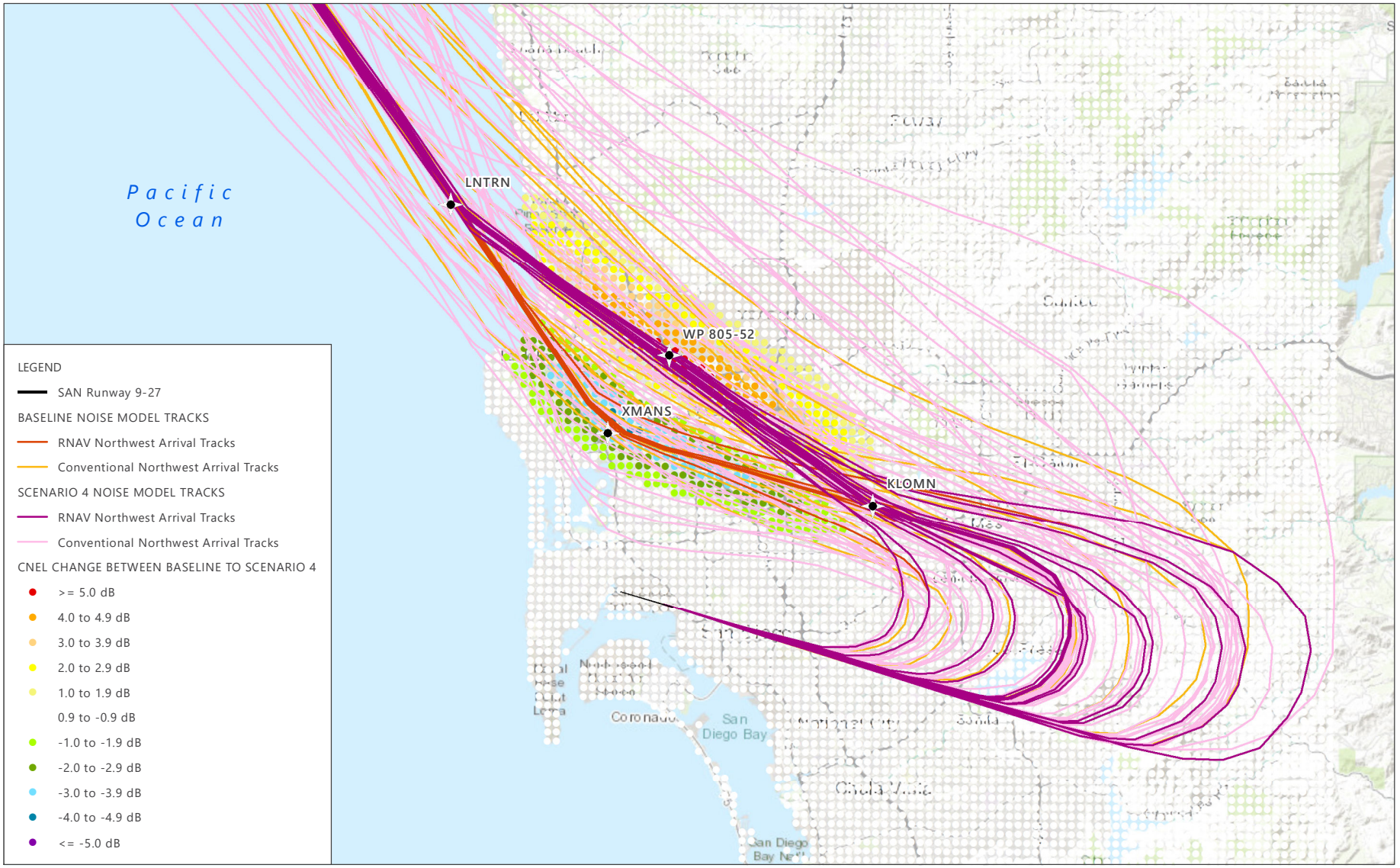
SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (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



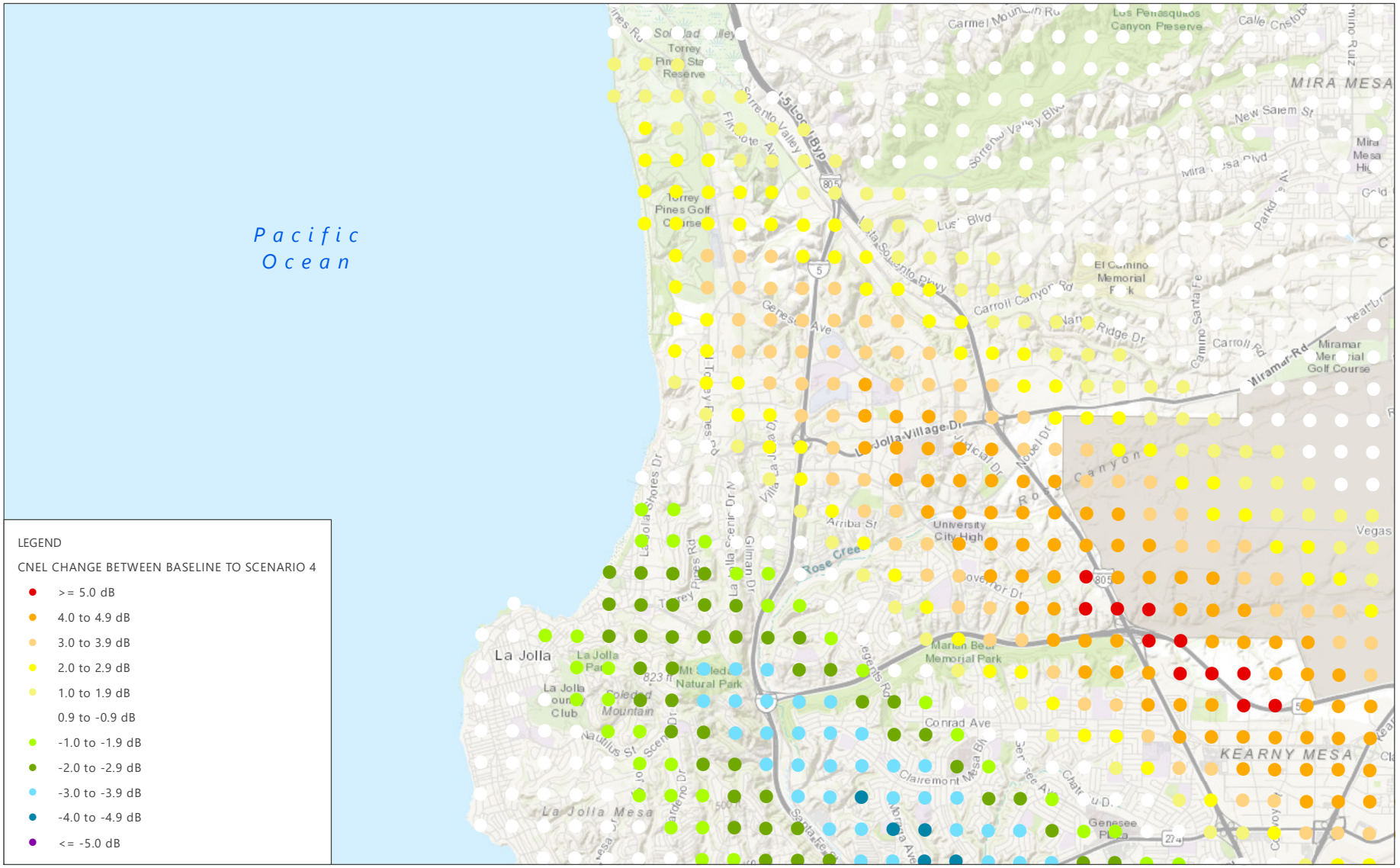
SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019 (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

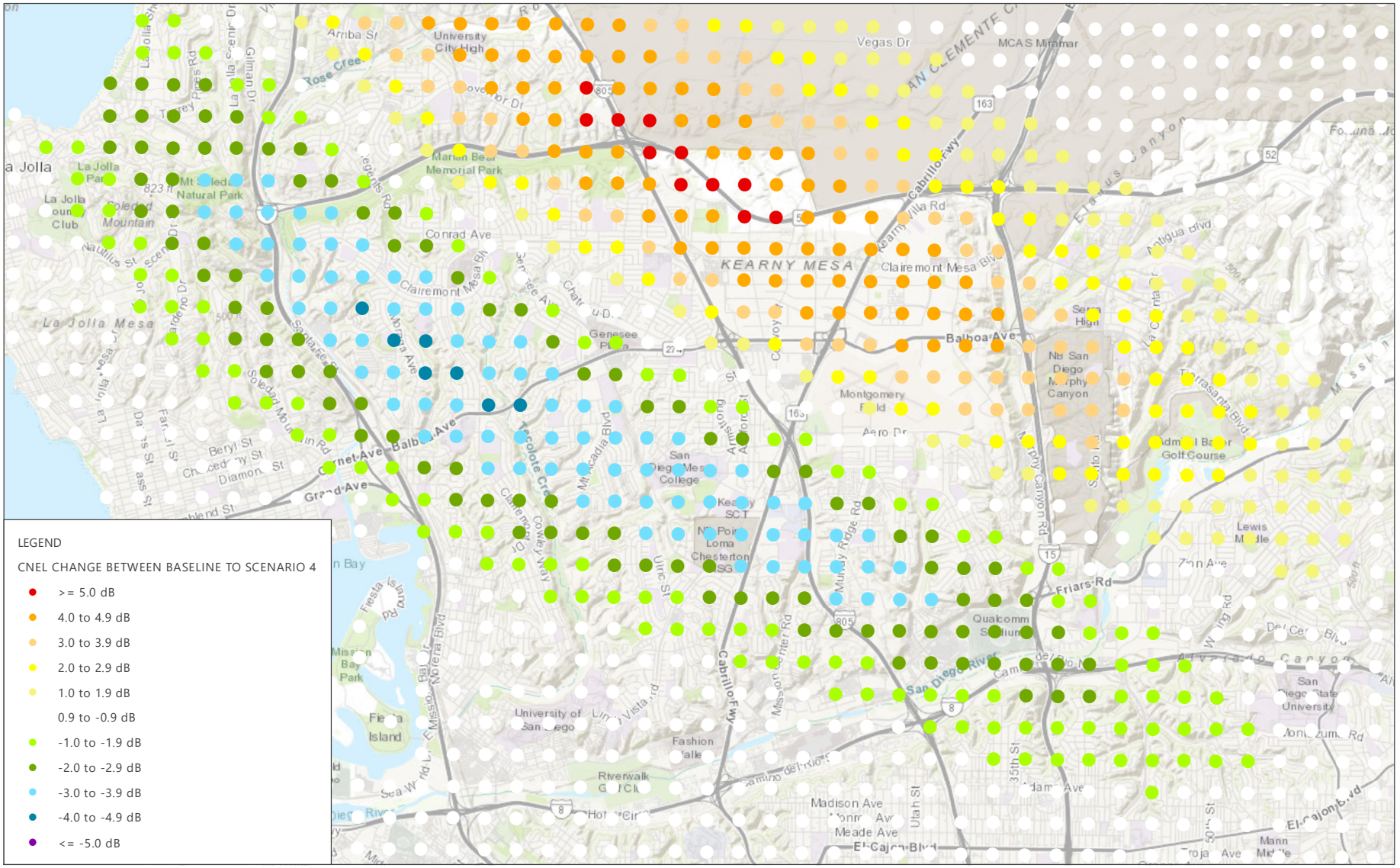


SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap Contributors, and the GIS User Community, March 2019 (basemap); Ricondo & Associates, Inc., March 2019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

EXHIBIT 6-8

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.

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