DRAFT Deliberative Document – For Discussion Purposes Only

RICONDO®

San Diego International Airport
East County Working Group - Aircraft Noise Concerns

Meeting #5

PRESENTED TO:
SDIA East County Working Group

PRESENTED BY:
Stephen C. Smith

PRESENTED ON:
December 11, 2019

Agenda

- Introductions
- Meeting Objective
- Final Design Concepts
- Noise Modeling Screening Results
- Recommendations
- Next Steps

Meeting Objective

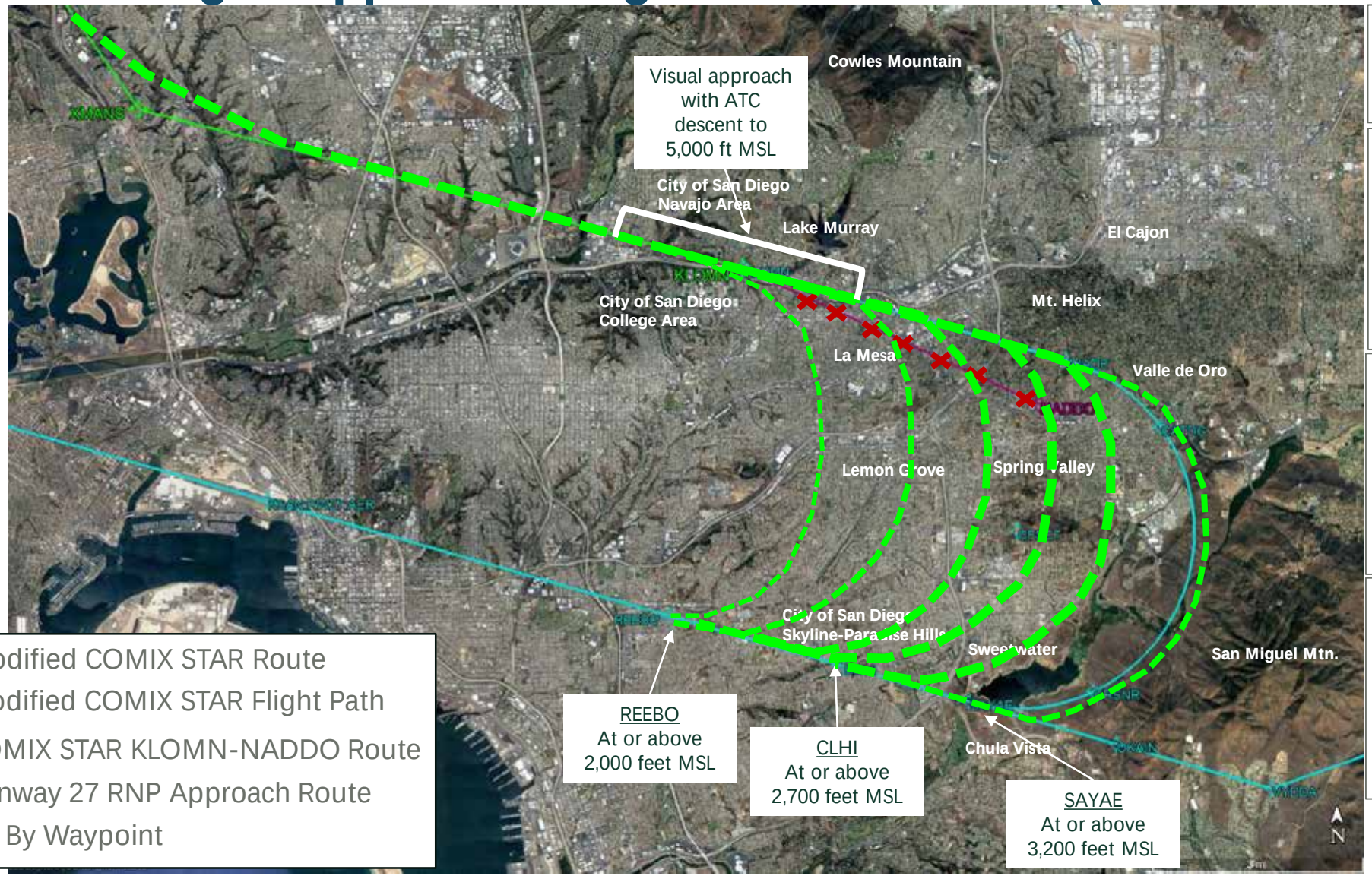
- Review final design concepts
- Review aircraft noise model screening results
- Discuss recommendations

Final Design Concepts

Final Concept Overview

- A single draft concept is proposed – made of multiple procedures based on when FAA can accommodate
- Includes two existing procedures: Runway 27 RNP Approach and FAA ATC Managed Approach
- Modification of one existing procedure: COMIX RNAV STAR
- New RNAV approach procedure: Runway 27 RNAV approach during late night period
- Intent: procedure concepts are intended to be used when possible during a given day based on demand – provides opportunities for dispersion, higher altitudes on the downwind path and turning south over more compatible areas when able.
- Note:
  - Procedures will not prohibit FAA ATC from re-directing flight.
  - Will require encouragement to increase use of procedures.

FAA ATC Managed Approach – High Demand Periods (Remove NADDO Route)



Modified COMIX STAR Route
Modified COMIX STAR Flight Path
COMIX STAR KLOMN-NADDO Route
Runway 27 RNP Approach Route
Fly By Waypoint

Intent: Maintain dispersion as aircraft turn south to join the final approach

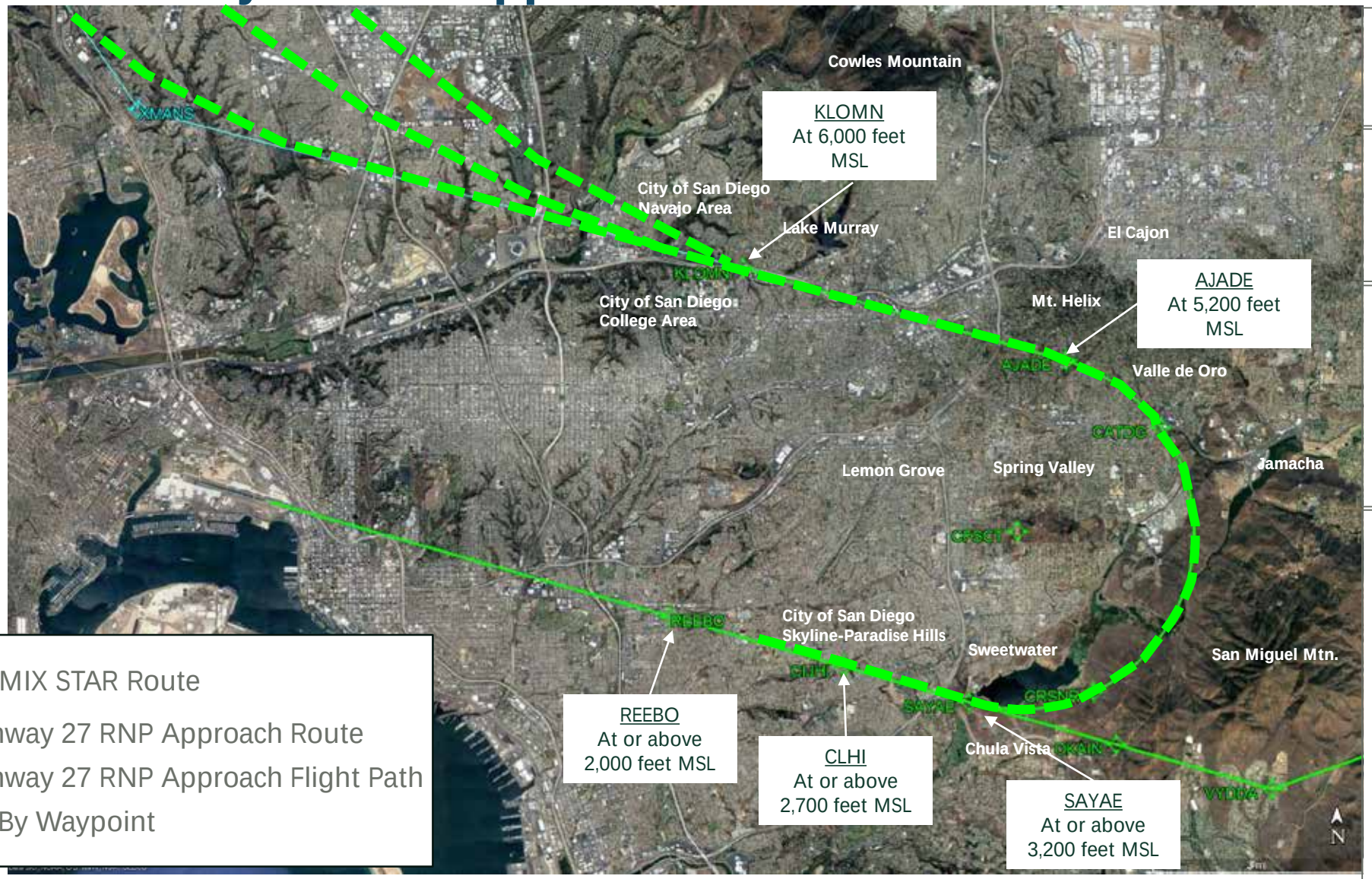
Concept: Discontinue use of the route between the KLOMN and NADDO waypoints and maintain dispersion procedures when air traffic demand is high

Objectives:
1. Raise Altitude on Downwind: No
2. Maintain Dispersion: Yes
3. Turn South Over Less Populated Areas: No

Potential Limitations: FAA may require the proposed Class B airspace be implemented prior to removing the KLOMN to NADDO route

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (modified COMIX STAR concept and flight path).

Maintain Runway 27 RNP Approach



Fly By Waypoint

COMIX STAR Route

Runway 27 RNP Approach Route

Runway 27 RNP Approach Flight Path

Fly By Waypoint

Intent: Reduce noise levels by locating arrivals over more compatible areas

Concept: Emphasize use of the Runway 27 RNP approach over ATC directed visual approach

Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: No
3. Turn South Over Less Populated Areas: Yes

Potential Limitations: RNP approach is limited to aircraft with required equipment and pilots authorized to fly the approach.

Would concentrate more arrivals over areas underneath the RNP flight path

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., April 2019 (RNP approach flight path).

Modify COMIX: Keep Arrivals at 6,000 ft up to KLOMN (Remove NADDO Route)

Intent: Reduce noise levels by raising jet arrival altitude, reduce closer turns to Airport and disperse traffic

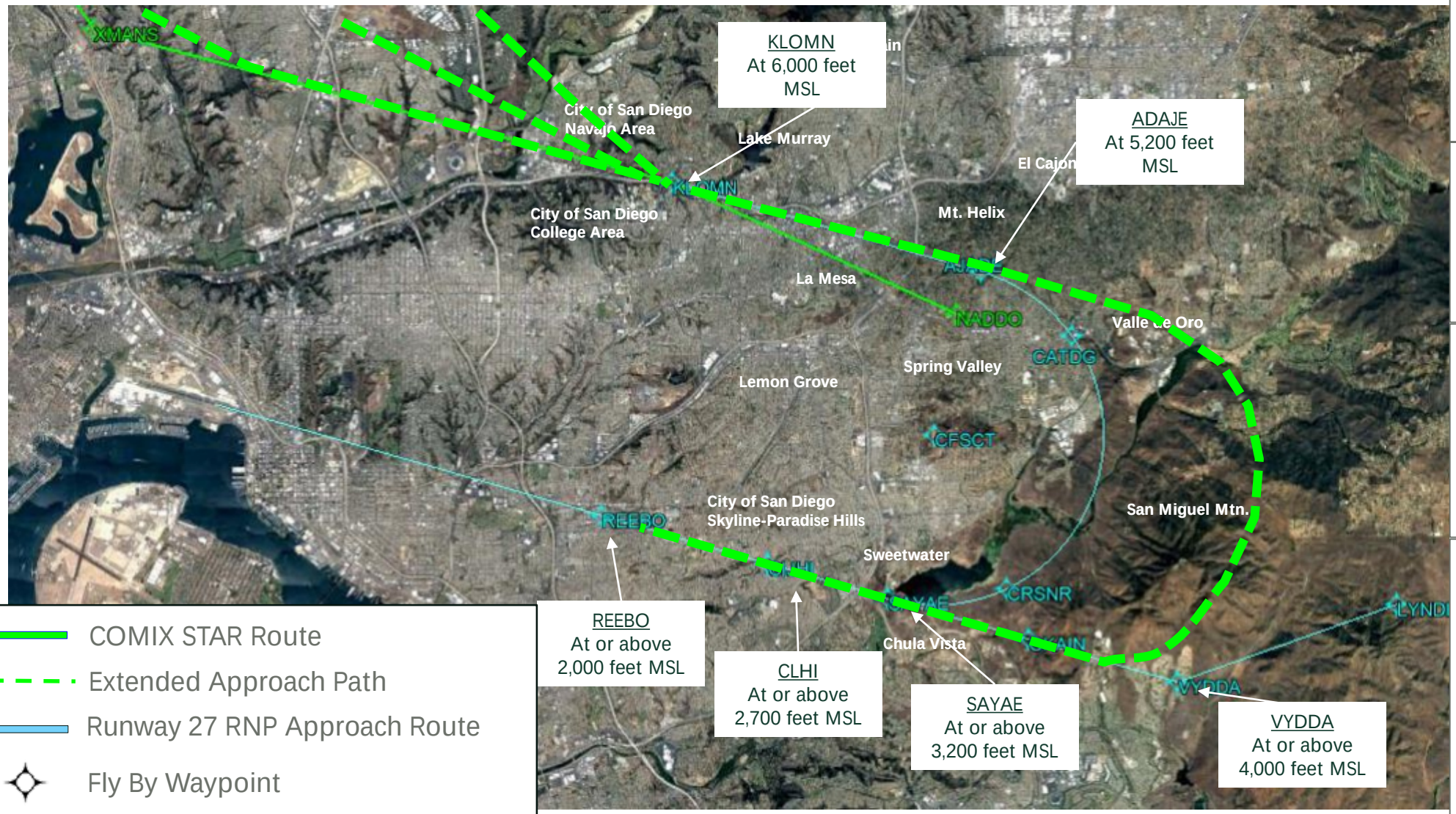
Concept: Remove route to NADDO and keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence descend to join final approach

Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: Yes
3. Turn South Over Less Populated Areas: No

Potential Limitations:
Limits area for FAA ATC to manage traffic to join the final approach. FAA may require the proposed Class B airspace be implemented prior to removing the KLOMN to NADDO route

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route, Minimum Vector Area); Ricondo & Associates, Inc., April 2019 (NADDO at 6,000 ft MSL concept).

New RNAV Approach: RNAV Approach from KLOMN to Nearby VYDDA



Intent: Reduce noise levels by raising jet arrival altitude and moving traffic further east

Concept: Keep jet arrival altitude at 6,000 ft. MSL at KLOMN waypoint, thence follow RNAV approach further east

Objectives:
1. Raise Altitude on Downwind: Yes
2. Maintain Dispersion: No
3. Turn South Over Less Populated Areas: Yes

Potential Limitations:
Adds complexity to ATC and increases distance. May be applicable when demand levels are low during nighttime hours (11pm to 7 am). FAA acknowledged possible issues with conflicting traffic.

NOTE: Mean Sea Level (MSL) – height above sea level; Above Ground Level (AGL) – height above the ground
SOURCE: Google Earth, April 2019 (aerial photograph); Federal Aviation Administration, November 2018 (COMIX STAR route, Runway 27 RNP Approach route); Ricondo & Associates, Inc., July 2019 (proposed extended approach path).

Aircraft Noise Model Screening Results

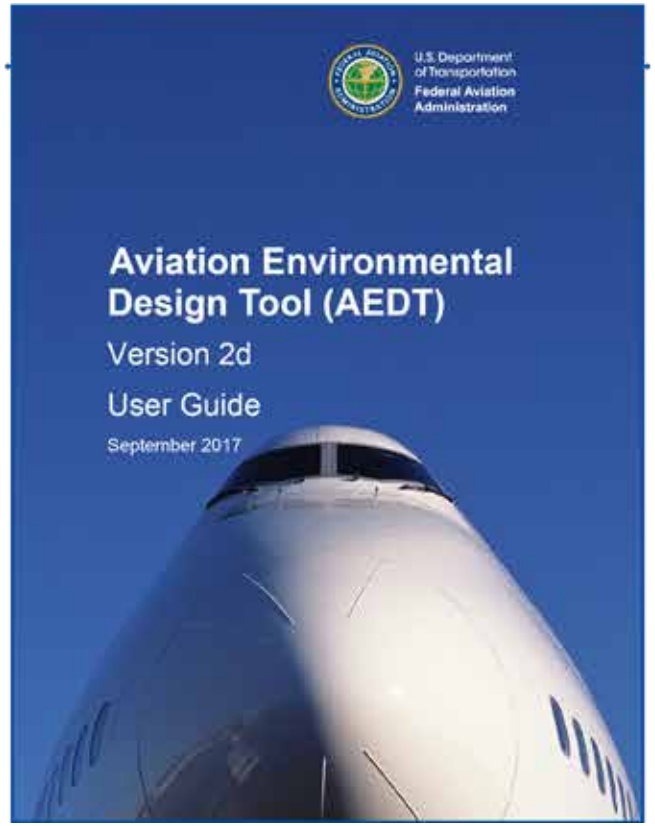
Noise Screening Methodology - AEDT

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

INPUT

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

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



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

Noise Screening

- **Intent:** Identify and estimate potential decrease or increase in noise caused by implementing a proposed concept RNAV design procedure

- **Approach:** Capture primary jet aircraft noise source from SDIA over community areas where proposed concepts are designed to reduce noise

- **Application:** Provide indications of potential changes in CNEL related to jet traffic subject to change as a result of a proposed concept.

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

Noise Screening Methodology - Baseline

- **Source:** Authority's Airport Noise and Operations Management System (ANOMS) flight operations and radar track data: May 2017 to December 2017 (note: used same data source for air traffic procedure analysis project for consistency)
- **Operation focus:** Jet arrivals from the northwest to Runway 27
- **Traffic flow focus:**
  - Arrivals from northwest (e.g., COMIX RNAV STAR, HUBRD STAR and FAA ATC radar vectoring from the northwest)

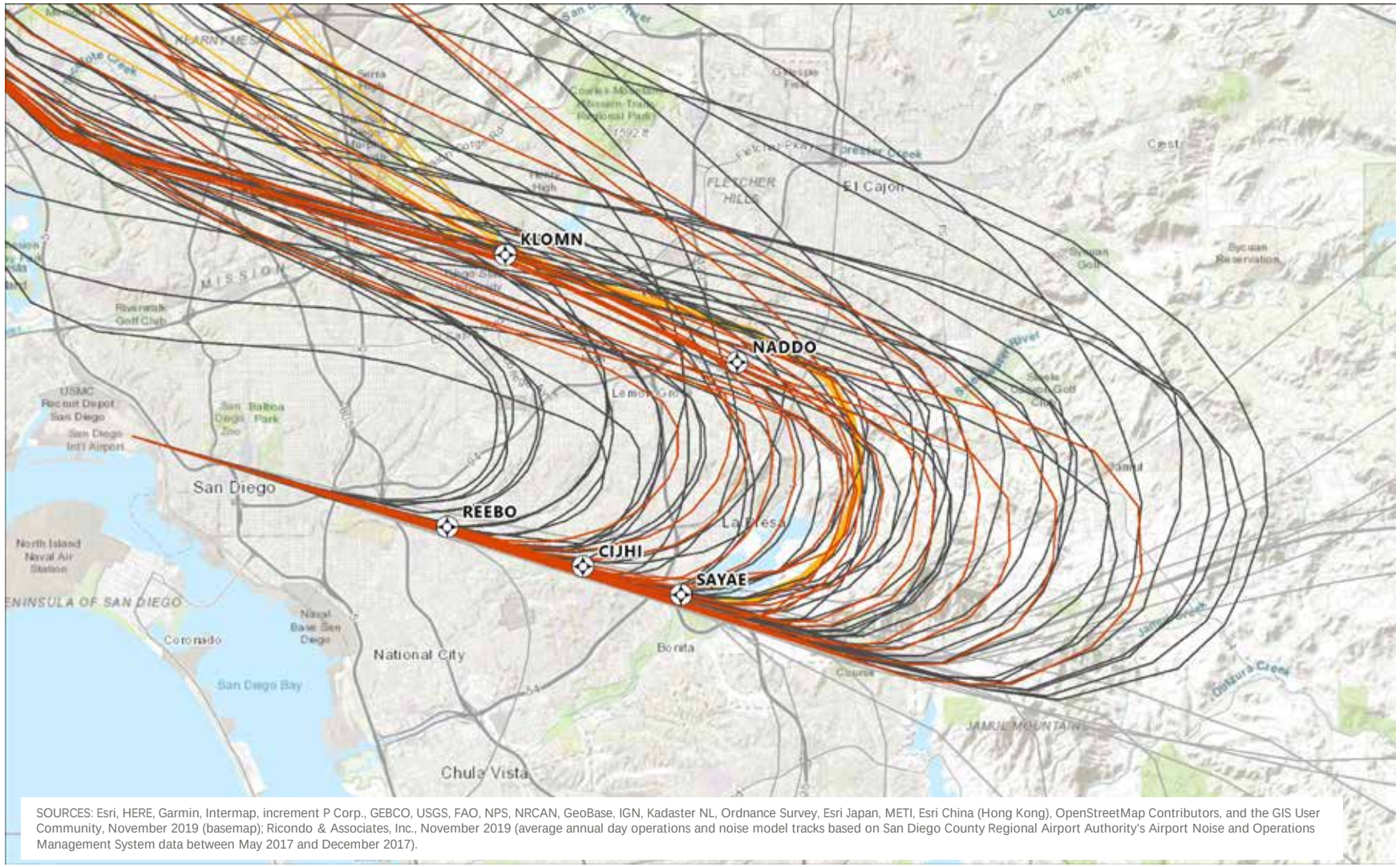
Noise Screening Methodology - Alternative

- **Develop** new noise model tracks for new proposed procedures
- **Modify** baseline noise model tracks to represent proposed final design flight path
- **Move** baseline operations to alternative noise model tracks
- **Maintain** noise model tracks and operations on tracks for traffic flows not related to proposed changes
- **Compare** CNEL values between Baseline and Alternative scenarios

Modeled Scenario

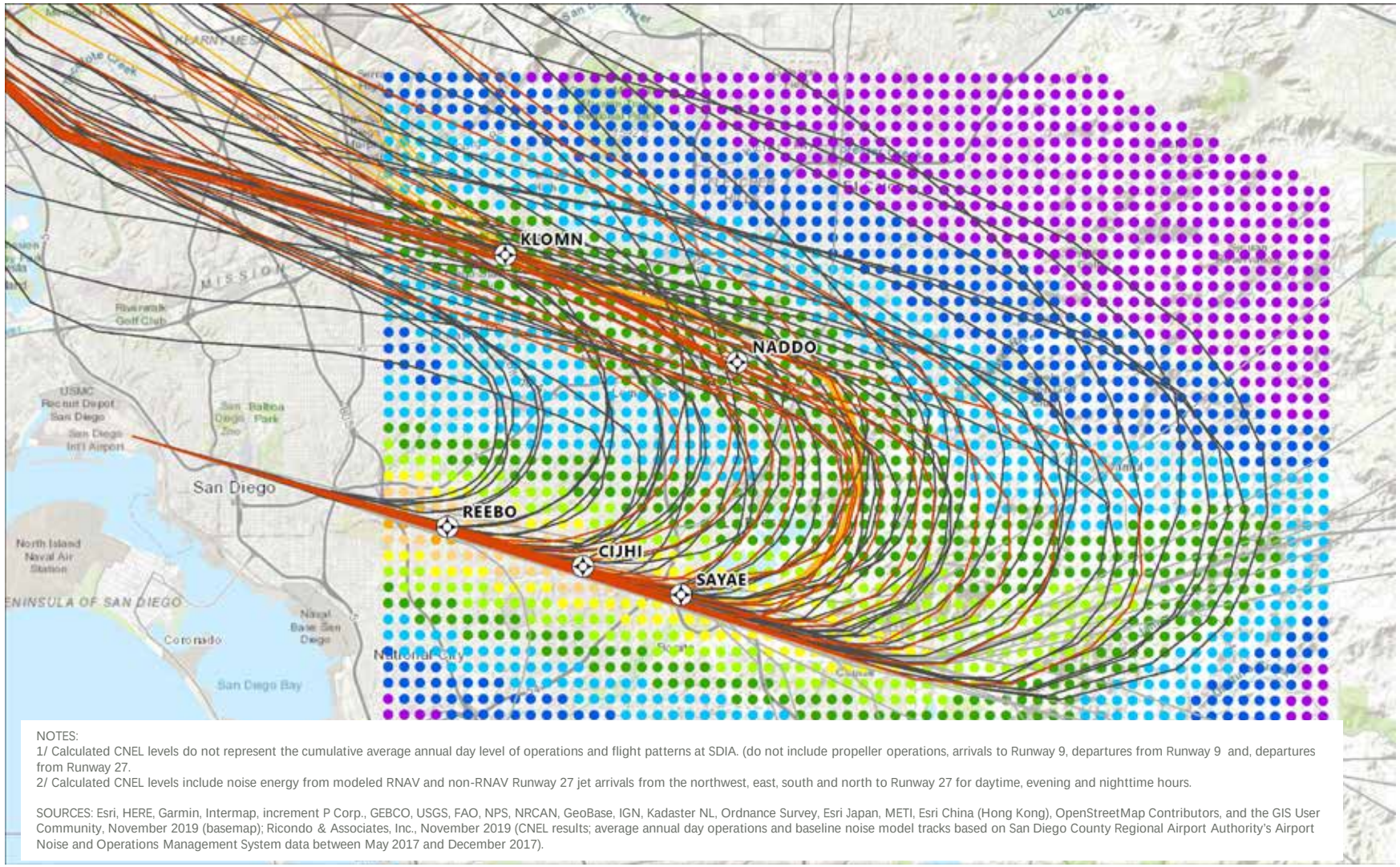
- Changes/Additions from Baseline
  - Modified COMIX RNAV STAR: all jet arrivals that operated between KLOMN and NADDO waypoints under the Baseline
  - Nighttime Runway 27 RNAV Approach: all jet arrivals between 11 p.m. to 7 a.m.
- Maintained from Baseline
  - Runway 27 RNP Approach
  - Turns to final prior to or at KLOMN waypoint
  - Arrival traffic from the north, east and south
- Scenario does not represent cumulative average annual day noise exposure levels

Aircraft Noise Screening - Baseline Model Flight Tracks



SOURCES: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), OpenStreetMap Contributors, and the GIS User Community, November 2019 (basemap); Ricondo & Associates, Inc., November 2019 (average annual day operations and noise model tracks based on San Diego County Regional Airport Authority's Airport Noise and Operations Management System data between May 2017 and December 2017).

Aircraft Noise Screening - Baseline Model Flight Tracks and CNEL Ranges



LEGEND

Waypoints

Baseline Noise Model Tracks

- Northwest Jet Arrivals from KLOMN to NADDO Waypoints
- Runway 27 RNP Approach for Northwest Jet Arrivals
- FAA ATC Managed Northwest Jet Arrivals
- Jet Arrivals from the North, East and South

Baseline CNEL Range

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

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

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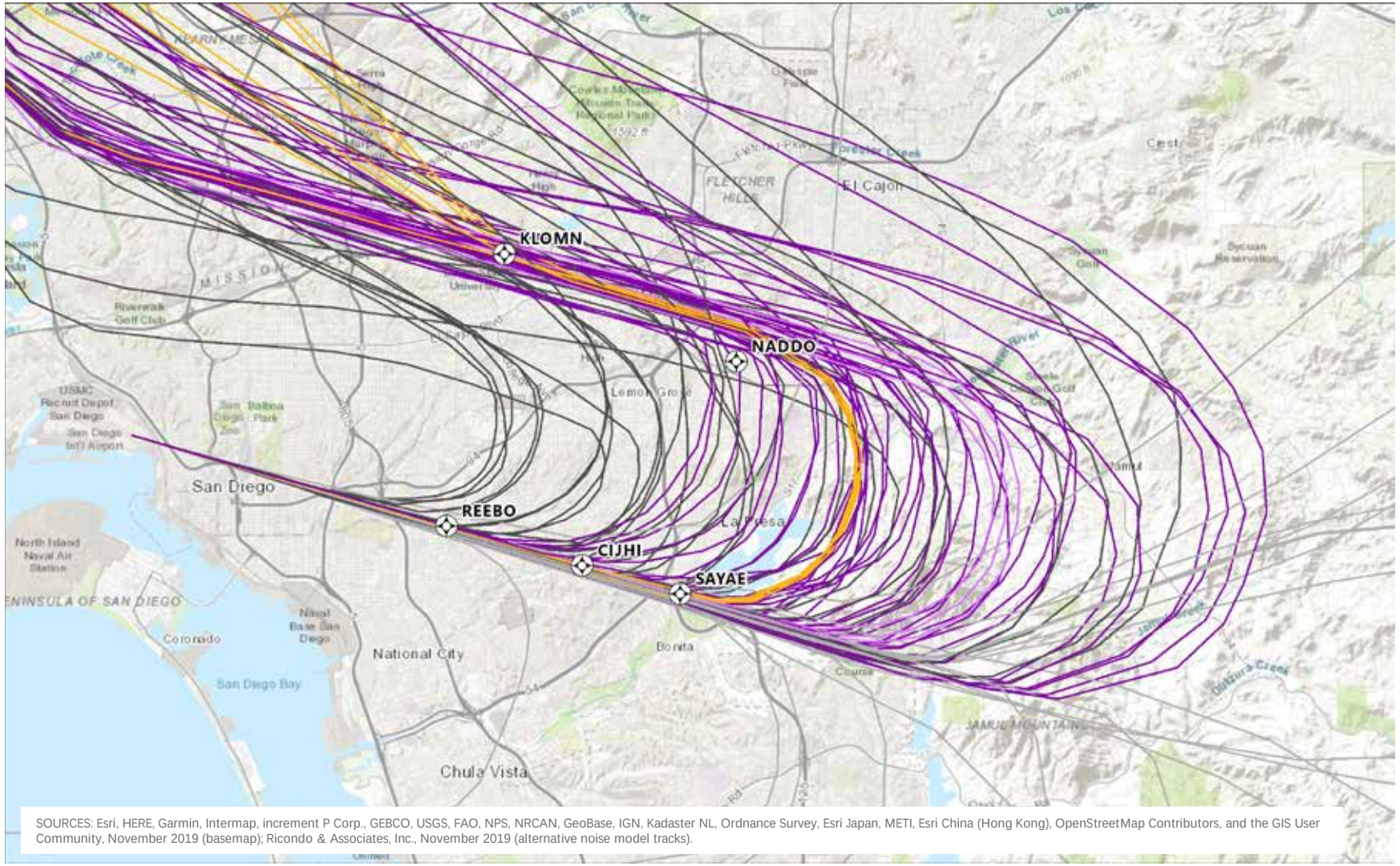
Aircraft Noise Screening – Alternative 1 Model Flight Tracks



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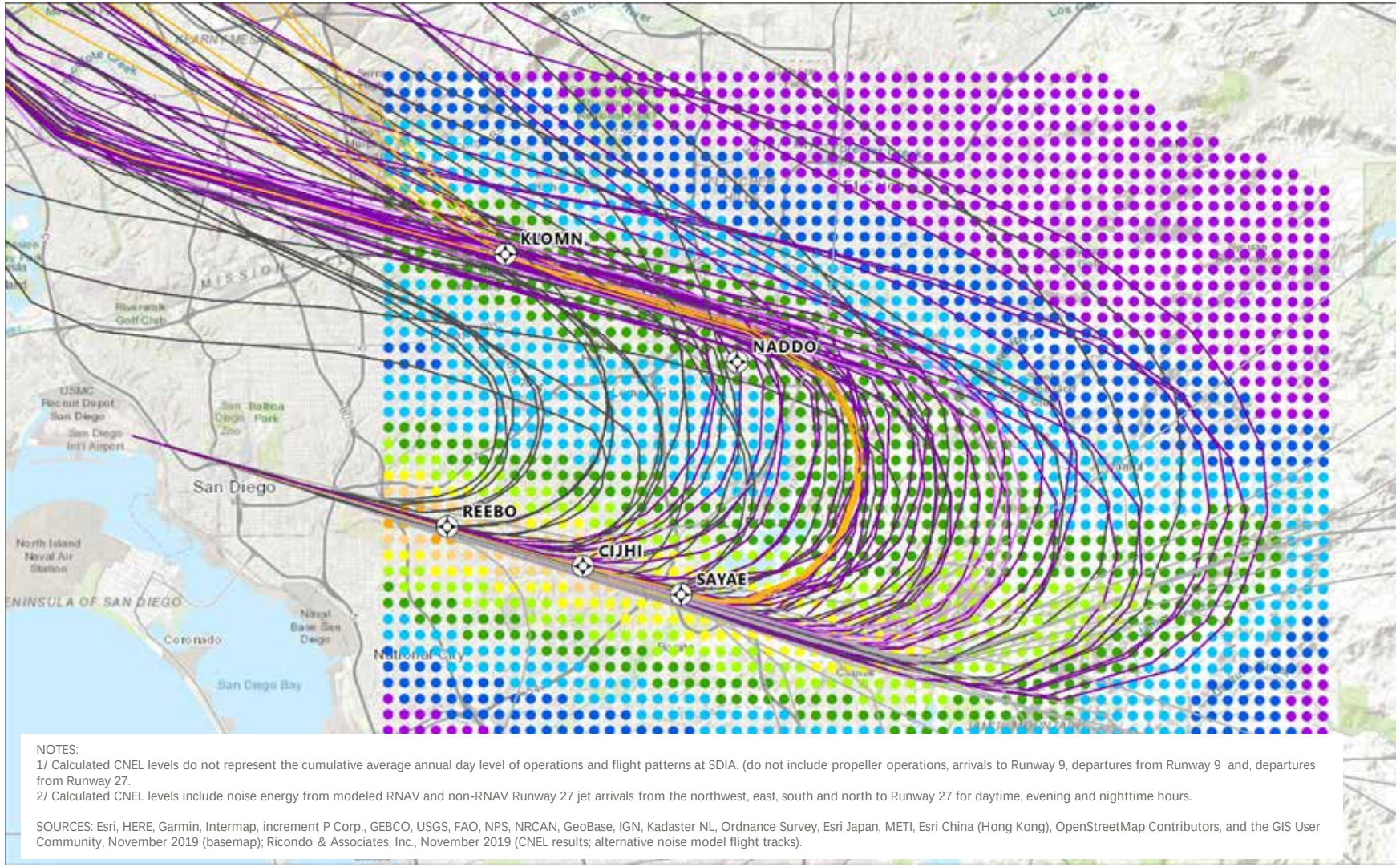
Aircraft Noise Screening – Alternative 1 Model Flight Tracks and CNEL Ranges



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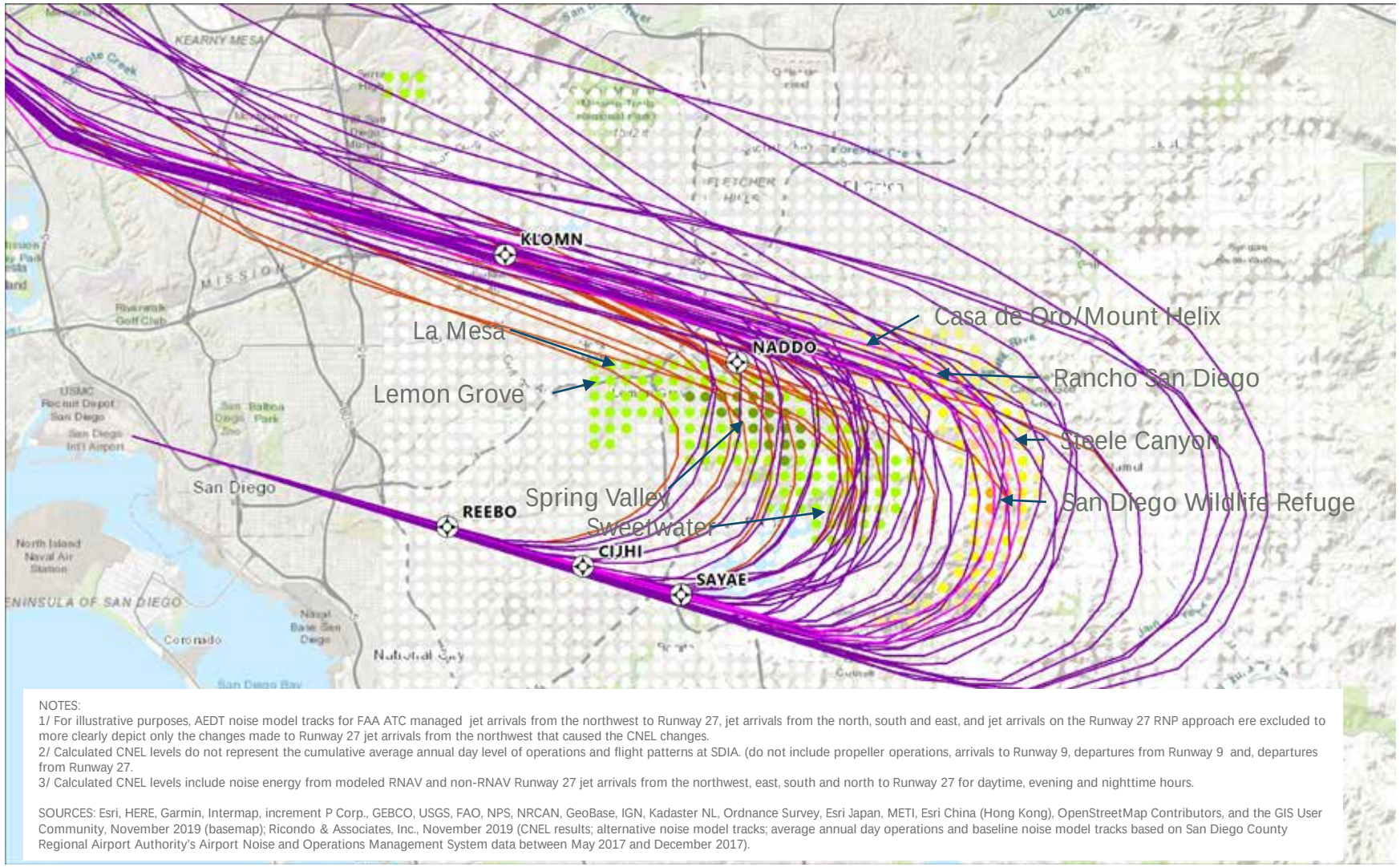
Aircraft Noise Screening - AEDT Alternative 1/Baseline Noise Model Tracks and CNEL Changes



NOTES:
1/ For illustrative purposes, AEDT noise model tracks for FAA ATC managed jet arrivals from the northwest to Runway 27, jet arrivals from the north, south and east, and jet arrivals on the Runway 27 RNP approach ere excluded to more clearly depict only the changes made to Runway 27 jet arrivals from the northwest that caused the CNEL changes.
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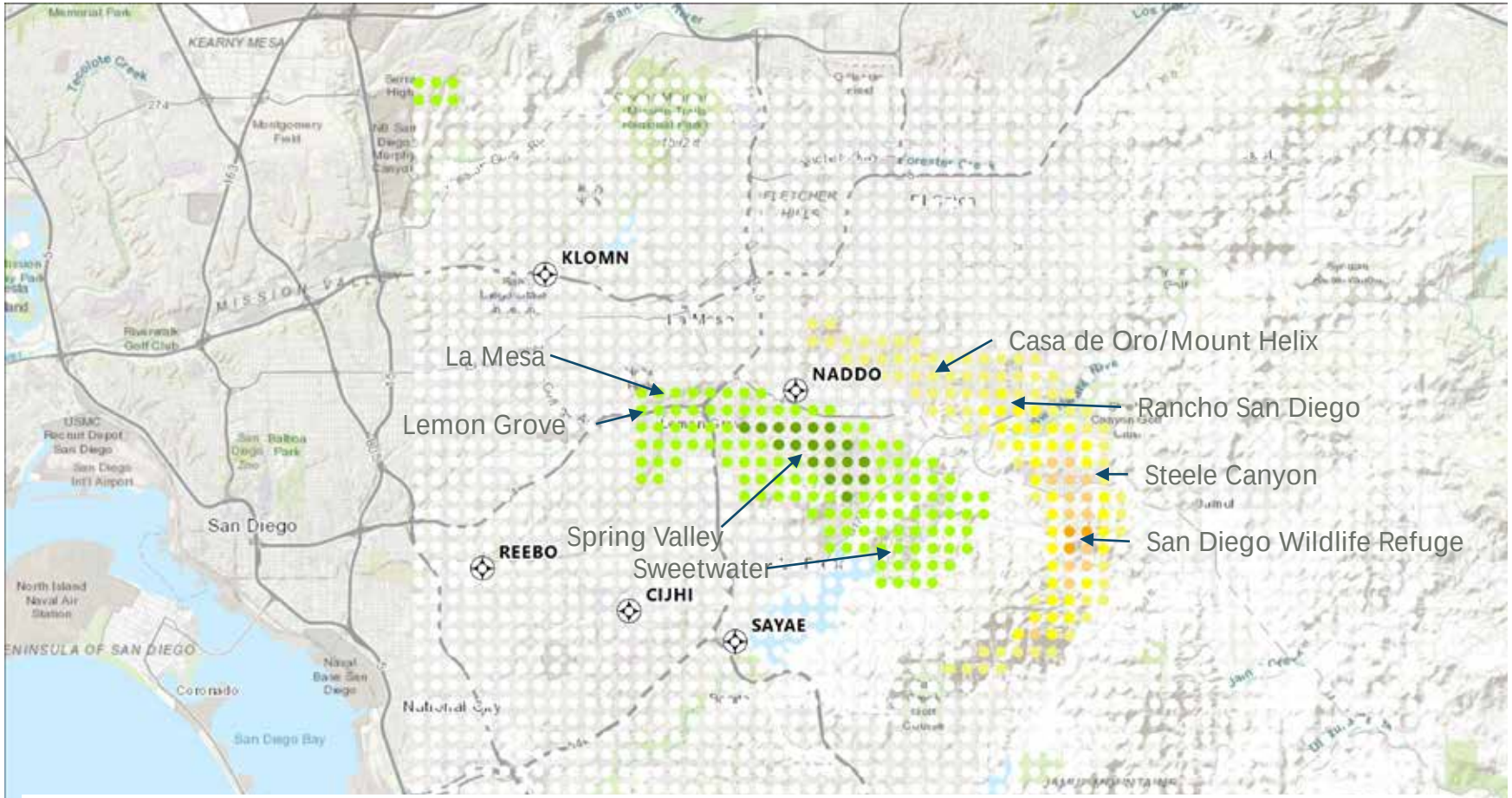
Aircraft Noise Screening – Alterative 1 CNEL Changes

LEGEND

Waypoints

CNEL Change Between Baseline and Alternative 1

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



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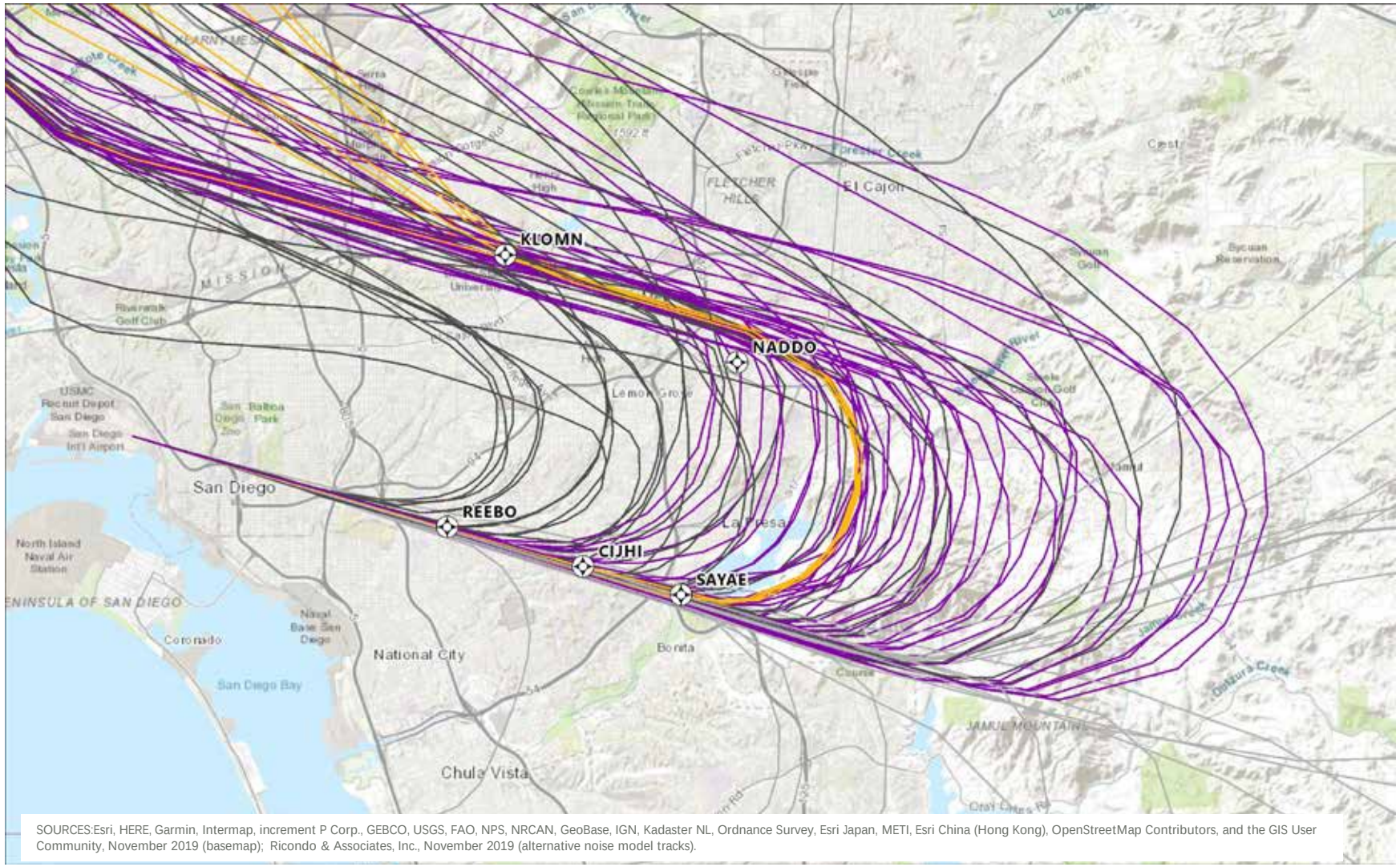
Aircraft Noise Screening – Alternative 2 Model Flight Tracks



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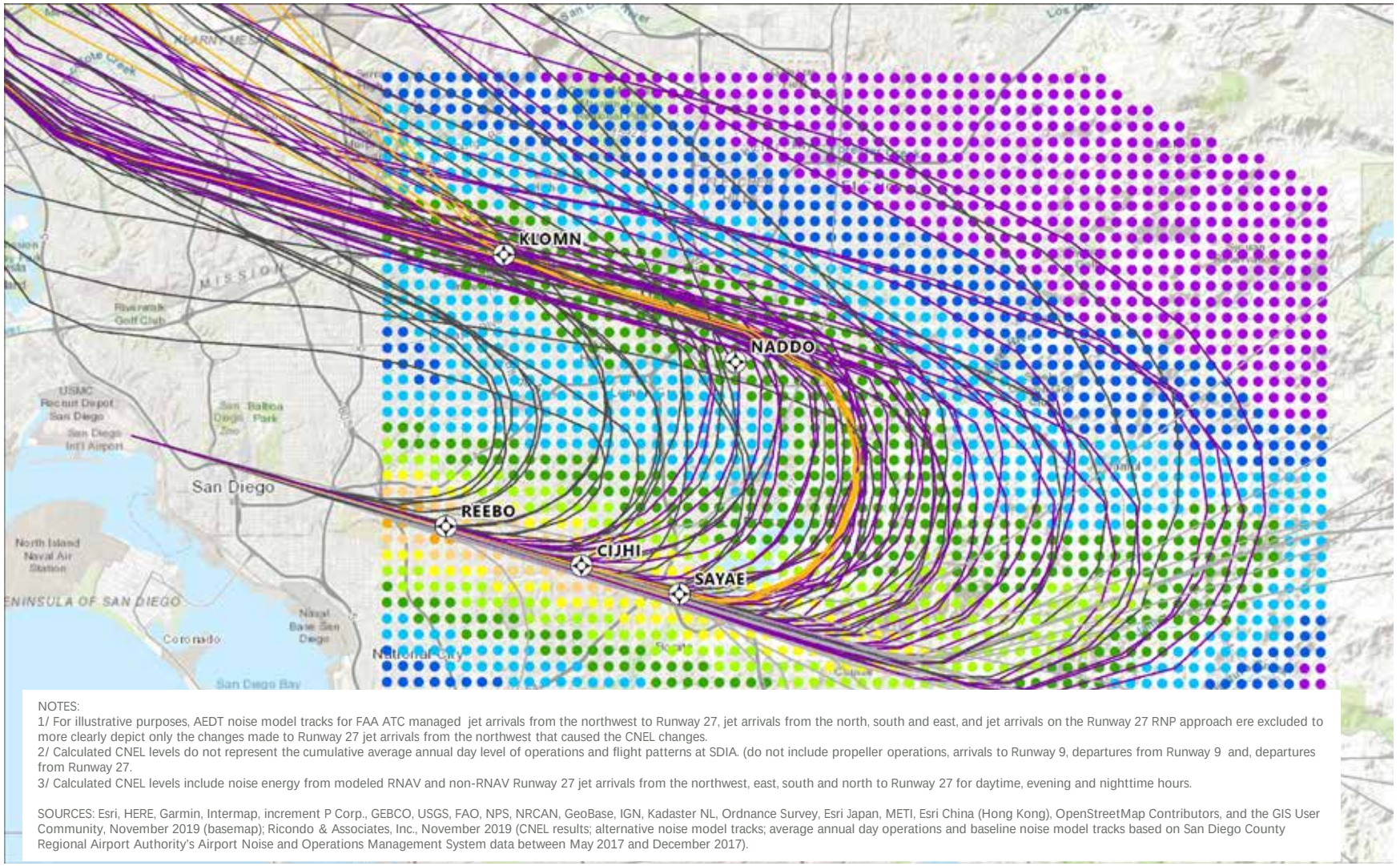
Aircraft Noise Screening – Alternative 2 Model Flight Tracks and CNEL Ranges



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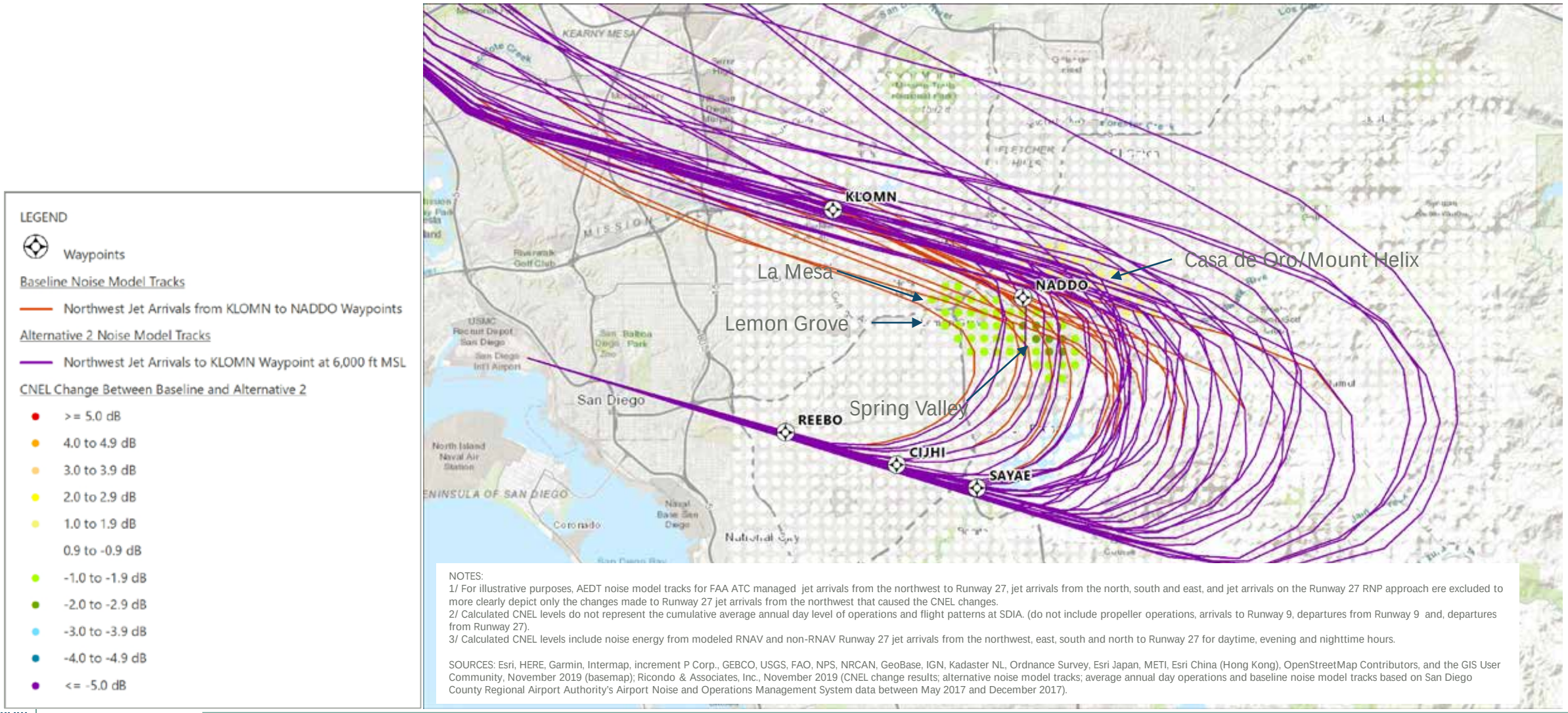
Aircraft Noise Screening - AEDT Alternative 2/Baseline Noise Model Tracks and CNEL Changes



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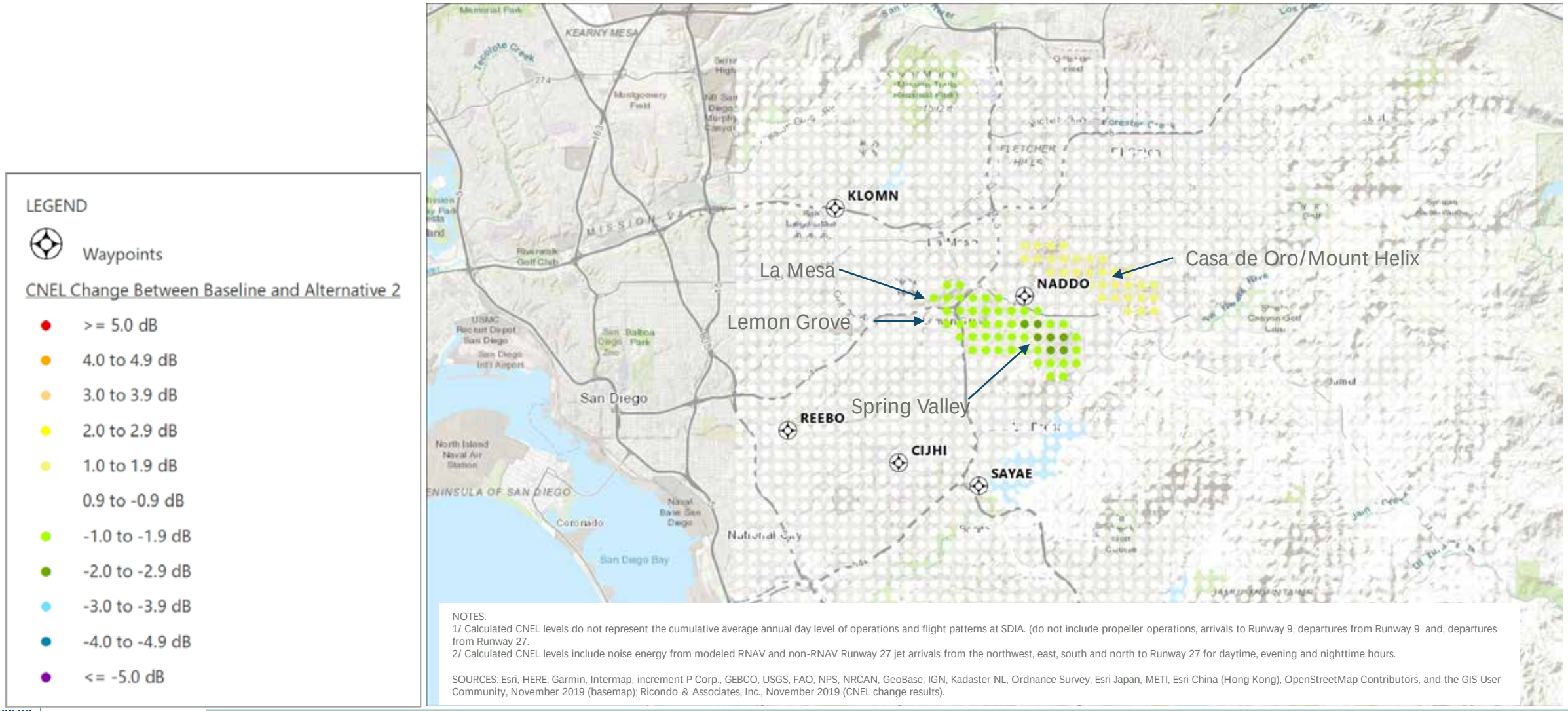
Aircraft Noise Screening – Alterative 2 CNEL Changes



Recommendations

Recommendations

- **Alternative 1 (Modify COMIX RNAV STAR and Nighttime RNAV Approach to Runway 27)**: Do not implement proposed nighttime RNAV approach procedure due to substantial increase in noise over areas such as Mount Helix, Rancho San Diego and Steele Canyon area

- **Alternative 2 (Modify COMIX RNAV STAR)**:
  - Based on initial parameters, do not recommend due to the increase in noise
  - ECWG feedback on decrease versus increase

- Encourage Use of COMIX RNAV STAR as designed
  - Keep jet arrivals at 6,000 ft. MSL at KLOMN waypoint while balancing efficiency
  - Evaluate and collaborate with FAA Southern California TRACON

Next Steps

Next Steps

- Present recommendations to ANAC for consideration