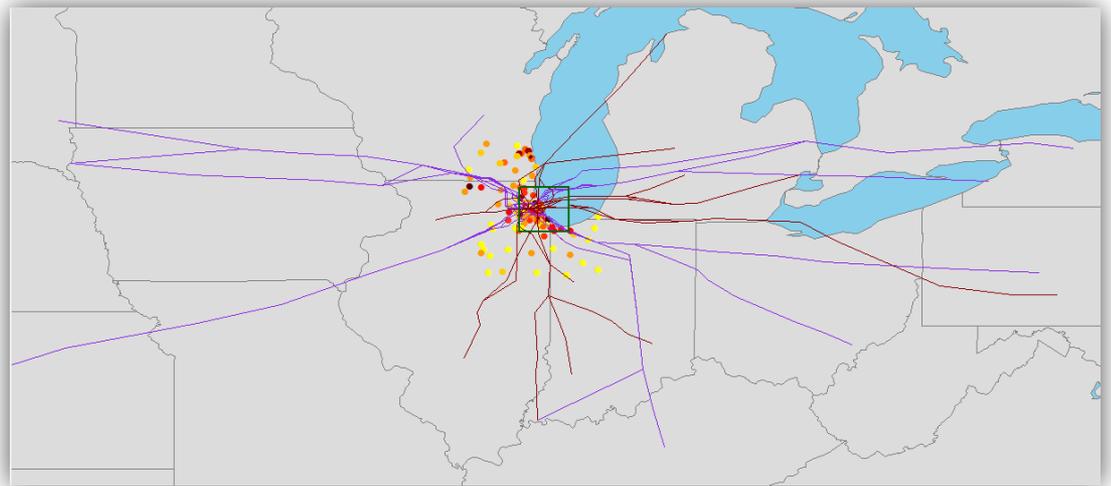


Outline

- ❑ Introduction to FAA's AEDT
- ❑ Example Interdependencies Analysis
- ❑ Conclusions



AEDT

Aviation Environmental Design Tool (AEDT)

- ❑ Investigate environmental interdependencies within a single tool
- ❑ Trade-offs between noise, fuel burn, and emissions
- ❑ Example: Optimized Profile Descents
 - Reduced noise => *Concentration of noise: potential increases*
 - Reduced fuel burn and CO₂

AEDT2a

- ❑ AEDT Version 2a: Released March 2012
- ❑ Addresses gap in environmental interdependency modeling
- ❑ Focus on Regional Analyses
 - More than 1 airport
 - Proposed air traffic airspace and procedure actions above 3,000 ft AGL

AEDT2a - Data

- ❑ AEDT Standard Input File (ASIF)
 - Supports importing disparate data sets
 - Extensible markup language (XML)
 - Import individual study elements
 - Accommodates iterative nature of environmental planning & analysis
- ❑ High Fidelity Weather
 - RUC: NOAA Rapid Update Cycle
 - GEOS: NASA Goddard Earth Observing System
 - NCAR: National Center for Atmospheric Research

AEDT2a – Key Functionality

□ Change Analysis

- Comparison of noise levels between two scenarios

□ Impact Evaluation

- Investigation of noise level based on operation and track assignment
- Operation reassignment

AEDT2a Graphical User Interface

The screenshot displays the AEDT 2A - STUDY software interface. The top of the window features a **Menu Bar** with options: File, Setup, View, Map, Run, Results, Help. Below the menu bar are three main panels:

- Study Hierarchy:** A tree view showing the project structure. It includes folders for Airports (3), Scenarios (3), and Airport Layouts (3). Under Airport Layouts, there are sub-folders for Cases (18) and Aircraft. A specific element, 'exexbf2.mdw.arr_STD', is highlighted.
- Tree Browser:** A list of elements for the 'Airport Layout Eleme' view. It includes checkboxes for Gates, Runways, and various gridfiles (e.g., gridfile_100x100, gridfile_10x10, gridfile_50x50). It also lists population density files (pop_grid_50x50.txt, pop120x160.txt, pop5069.txt) and an 'External Layers' section.
- Airport Geometry:** A large map area showing the geographical layout of the airport and surrounding terrain.

At the bottom of the interface is an **Information Box** with the following data:

Property Name	Property Value
Name	exexbf2
Case Type	Aircraft
Description	NSIF F
Start Time	11/18/
Duration	1 Day
Weather	Default

At the bottom right is a **Navigation Bar** containing navigation icons, an 'Auto Zoom' checkbox, a unit selector set to 'Meters', and coordinate fields showing Latitude 42.797179 and Longitude -88.496742.

Interdependencies Analysis

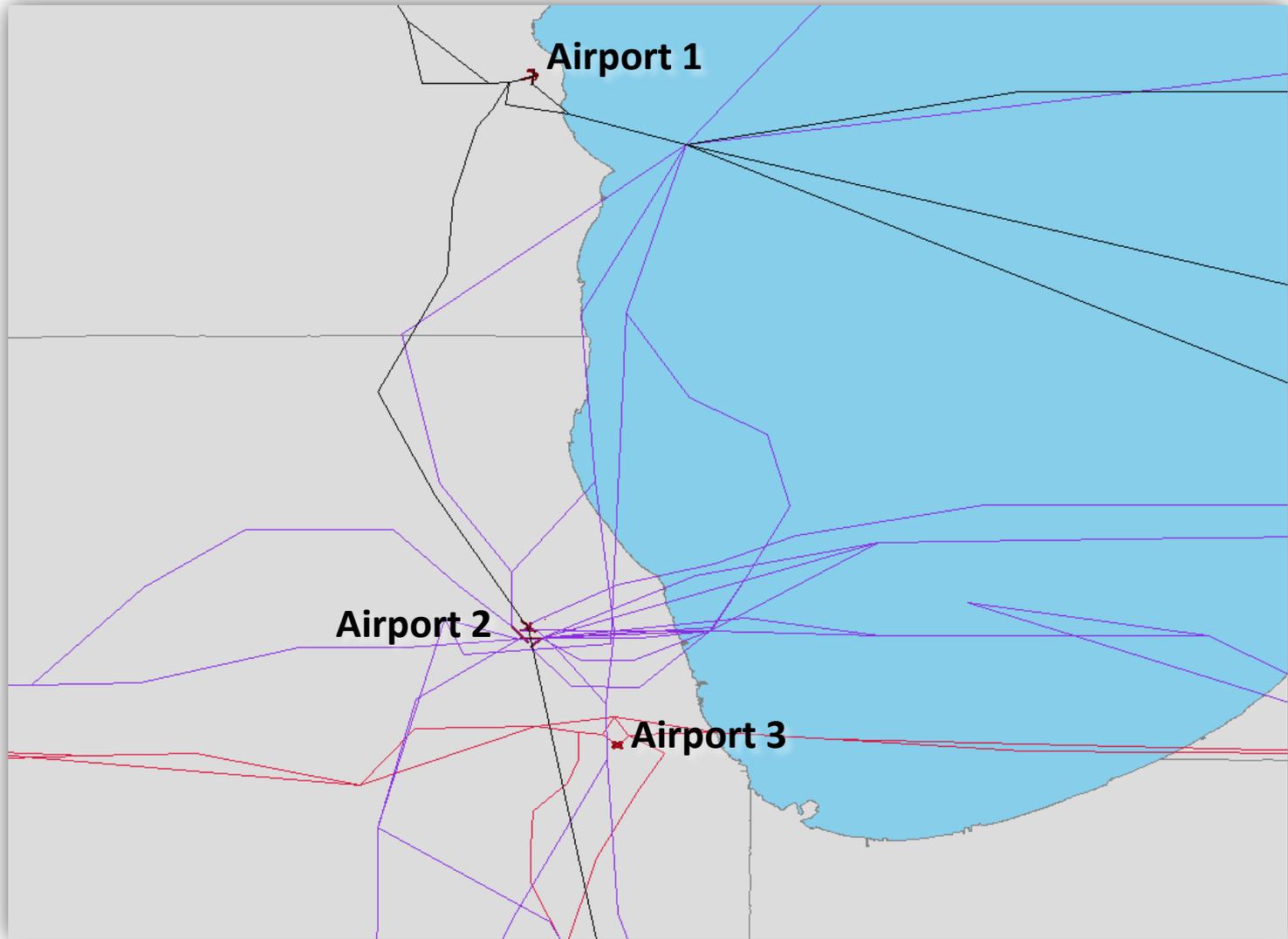
Sample Study

- ❑ Three commercial airports
- ❑ One geographic region
- ❑ Baseline scenario: “current” departure operations
- ❑ Alternative scenario: “future” growth in departure operations

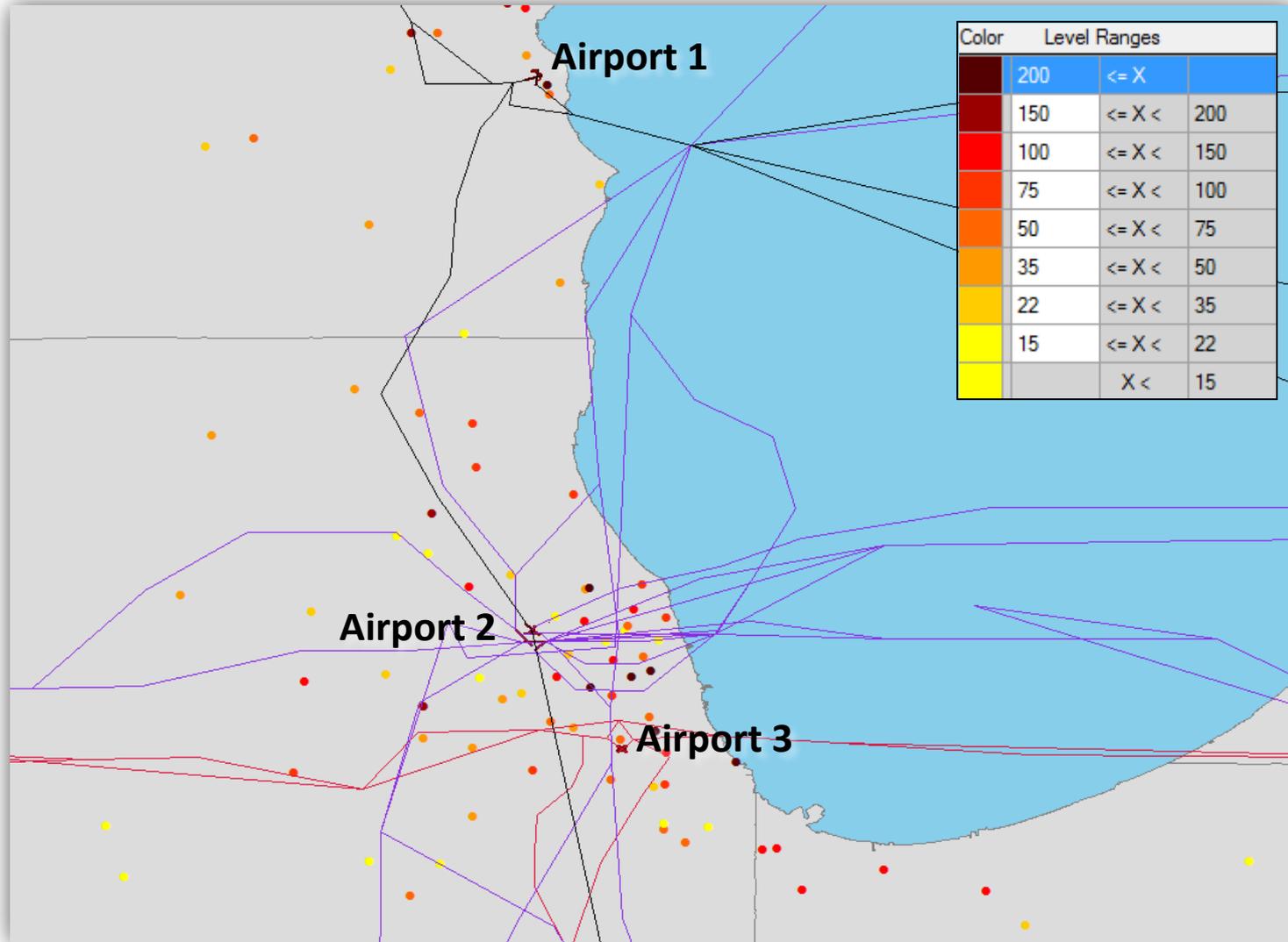
Analysis Goals

- ❑ Identify areas of interest
 - Sensitive areas
 - Areas with high population concentration
- ❑ Analyze proposed track configuration
 - Consolidate departure tracks
 - Evaluate noise, emissions, and fuel burn changes

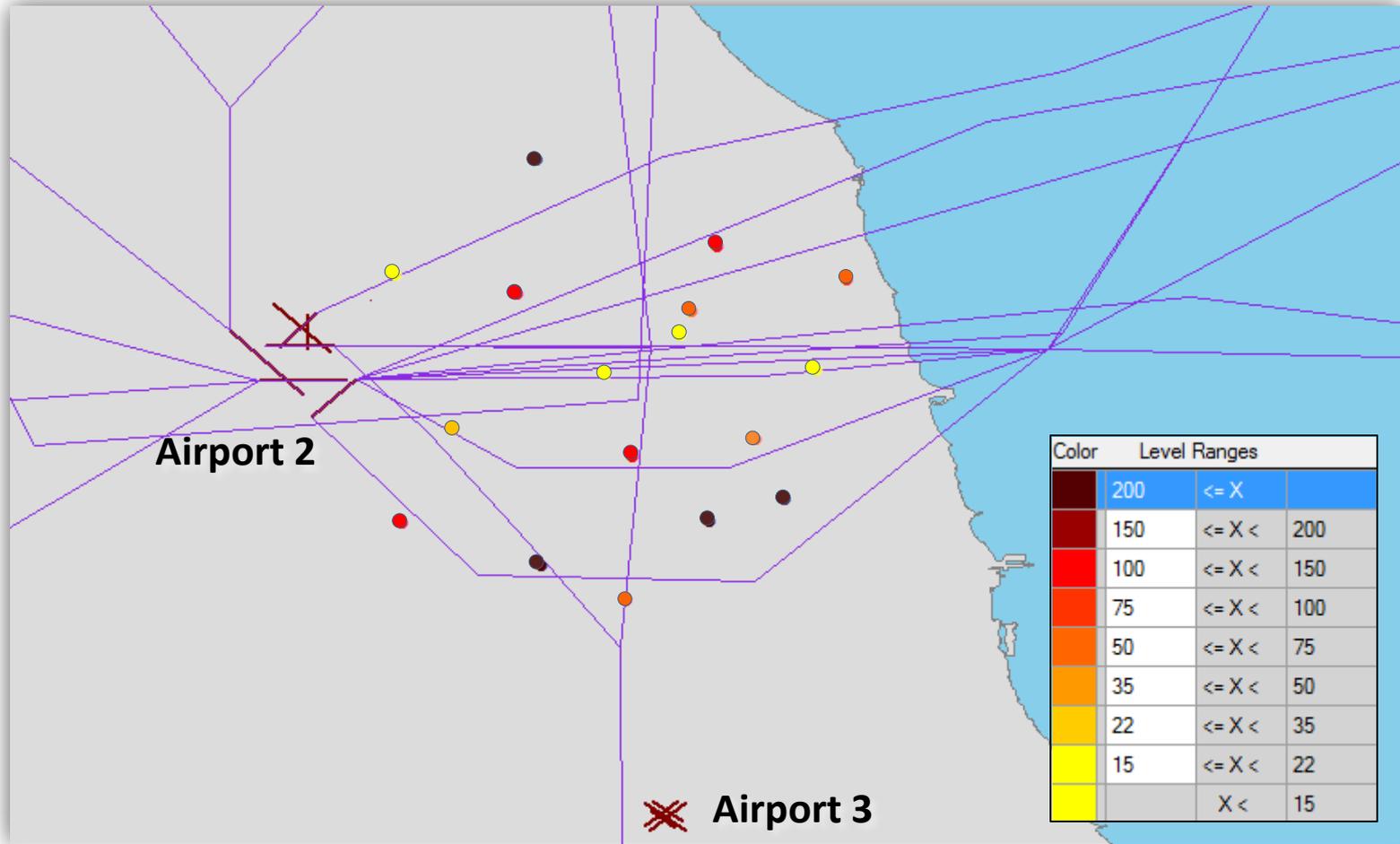
Airports and Departure Tracks



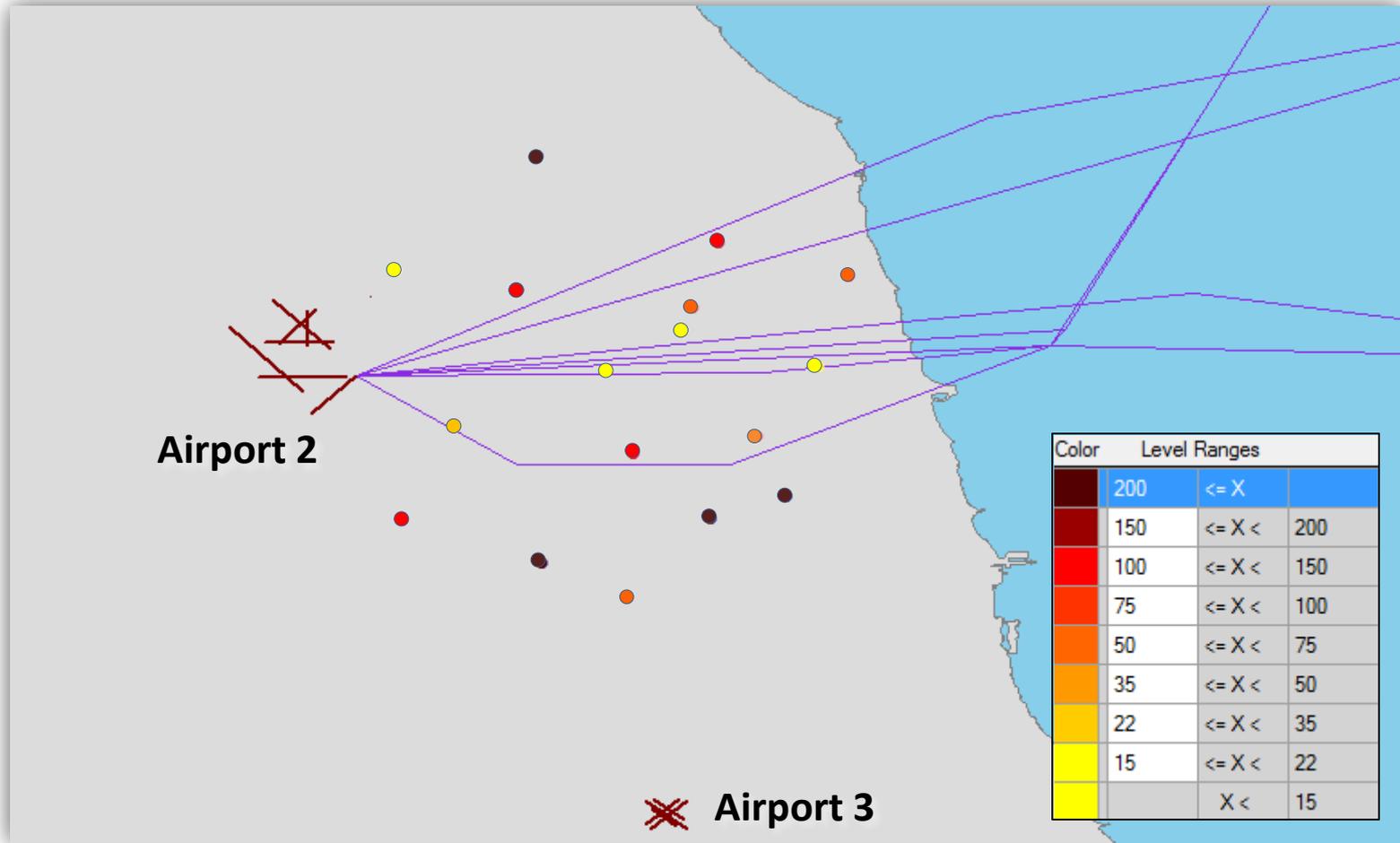
Population Representation



Area of Interest

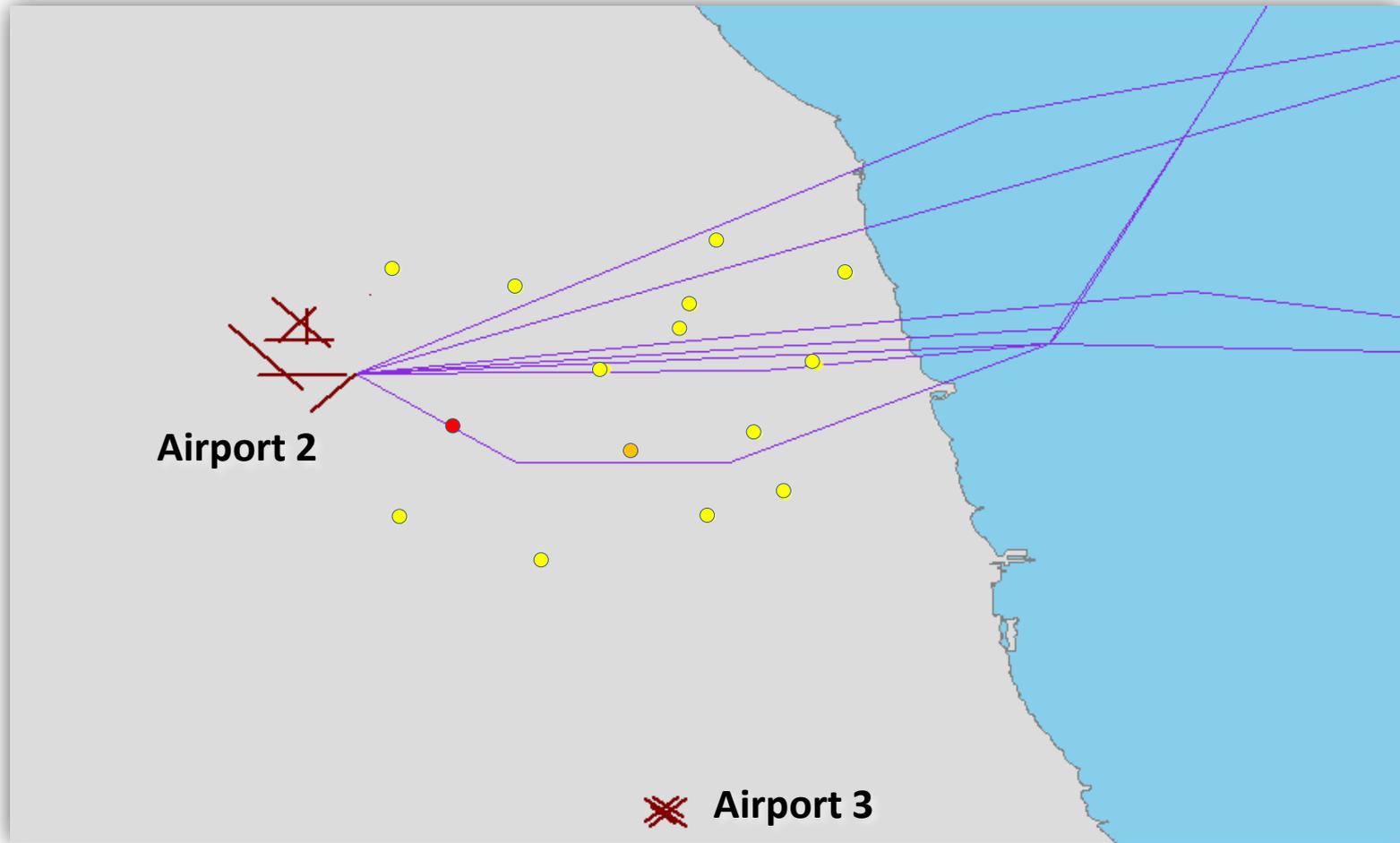


Area of Interest, Runway 1 tracks

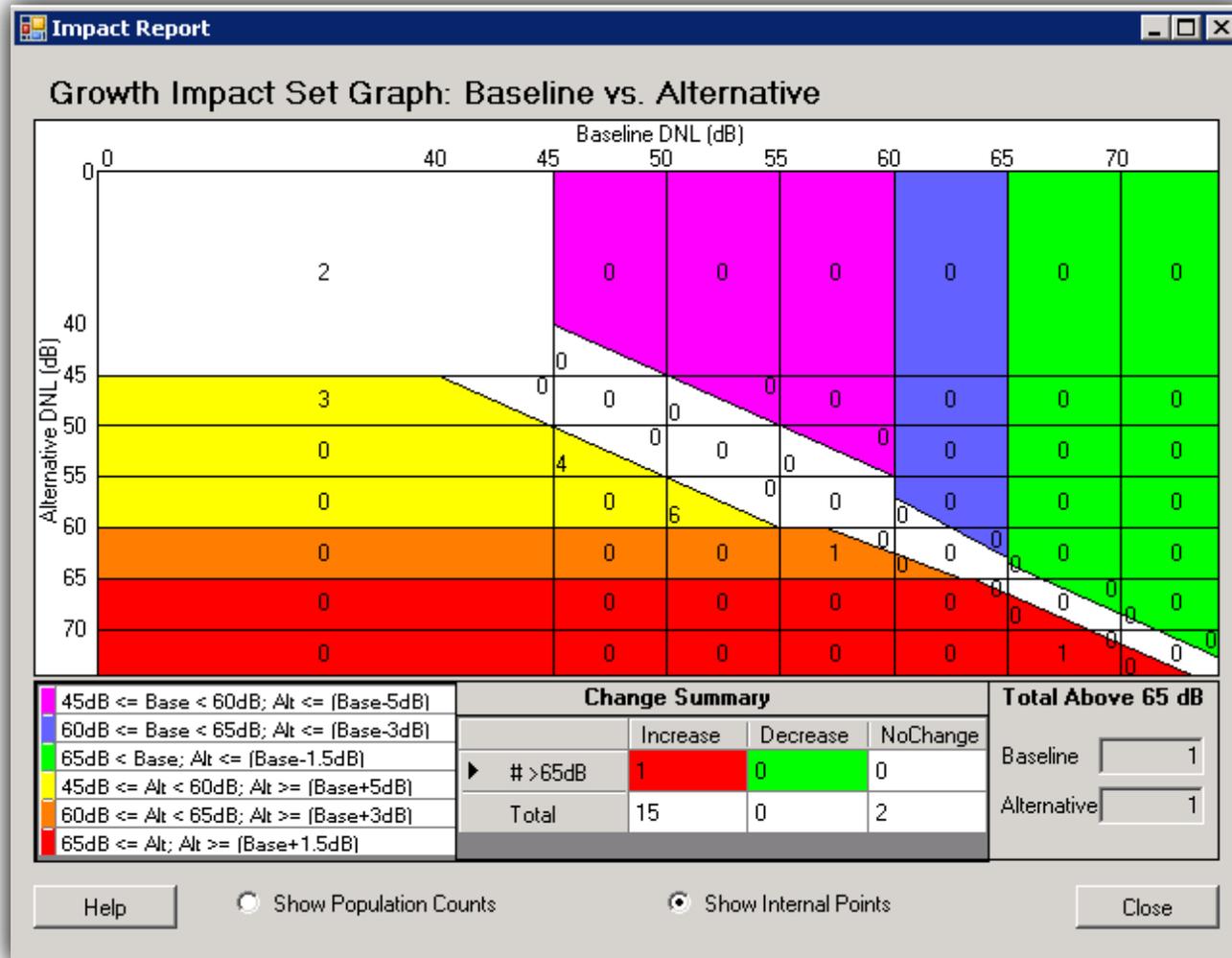


Noise Exposure Comparison

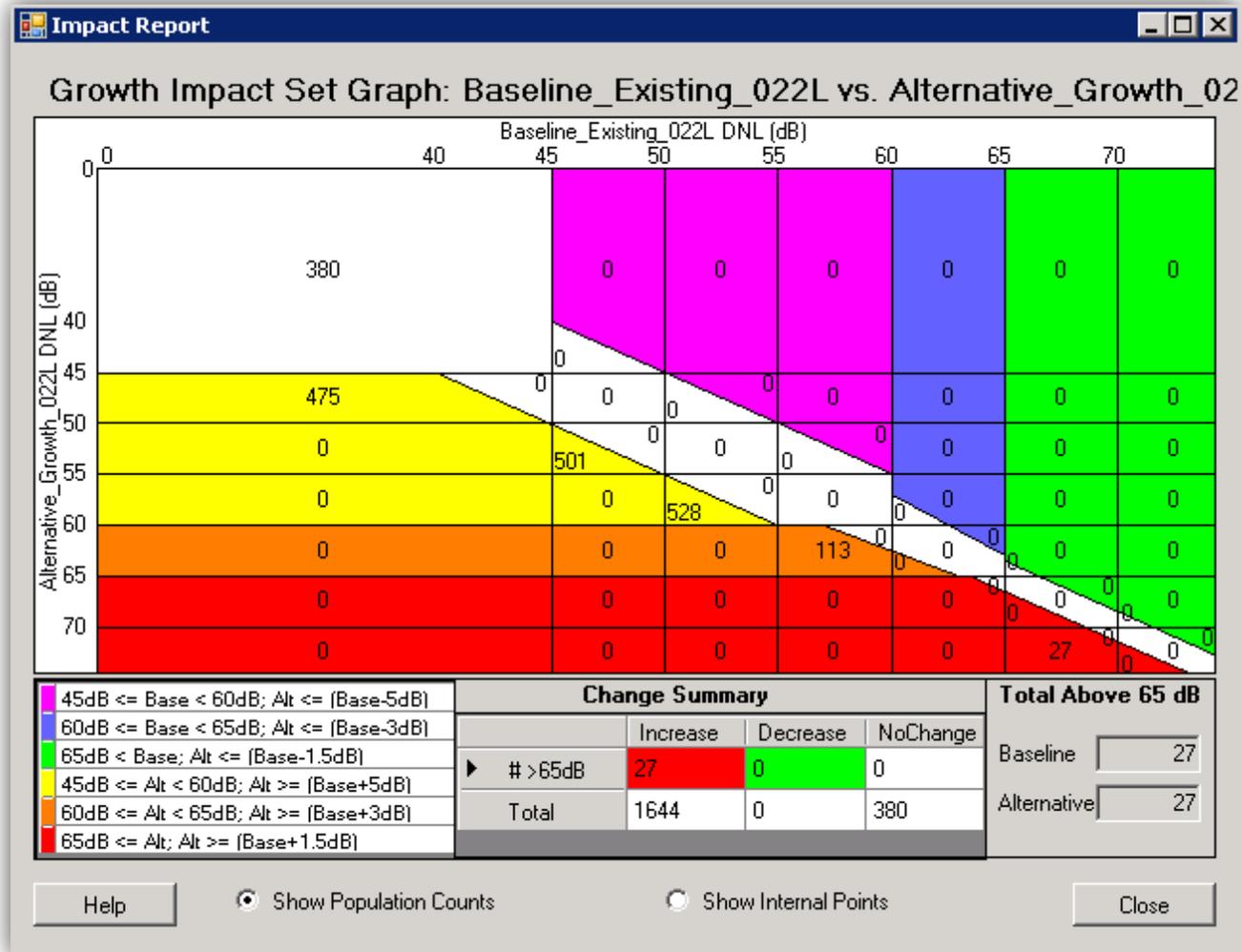
Baseline vs. Alternative



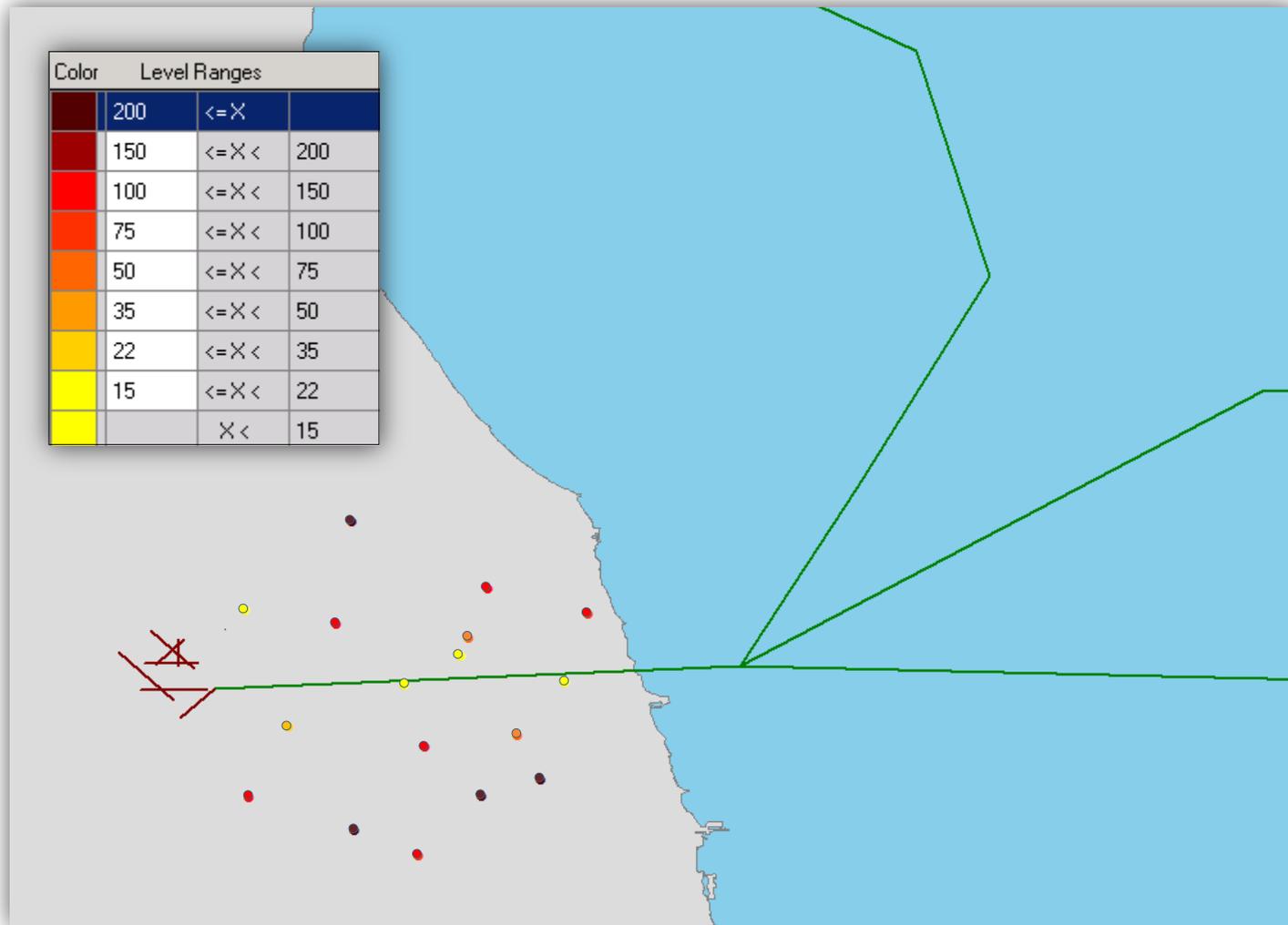
Noise Exposure – Graph, Receptor



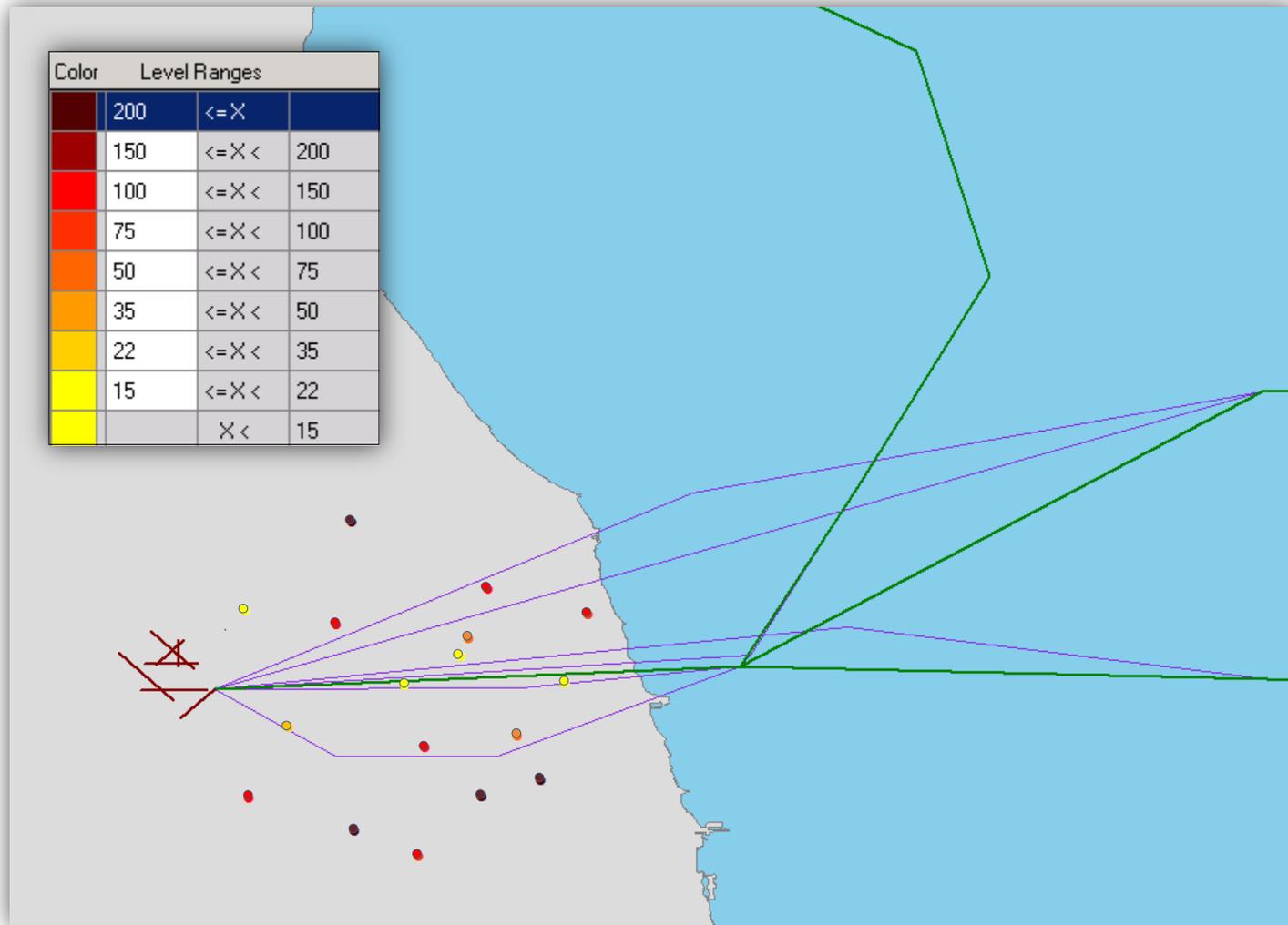
Noise Exposure – Graph, Population



Proposed Departure Tracks

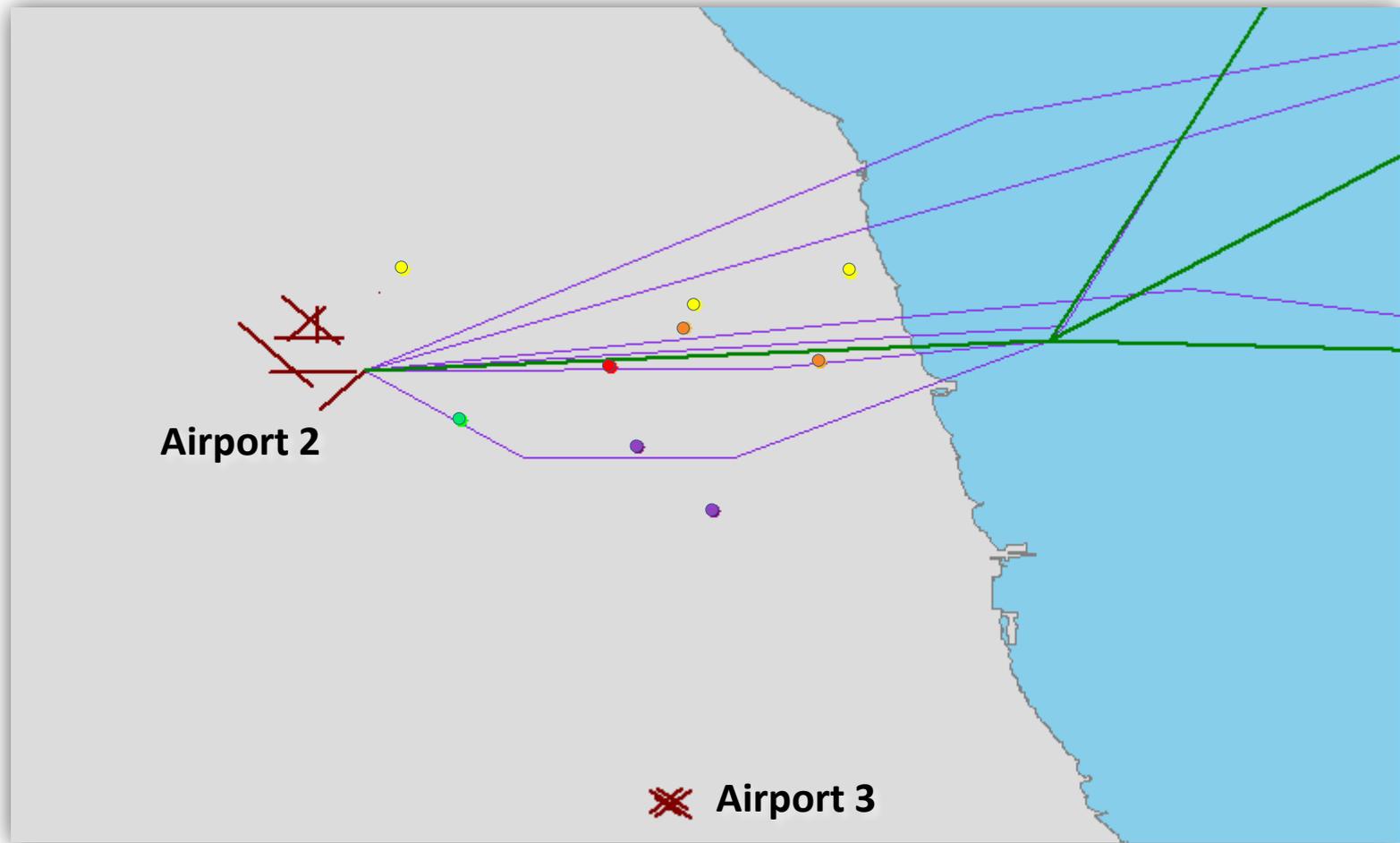


Original and Proposed Tracks



NEW Noise Exposure Comparison

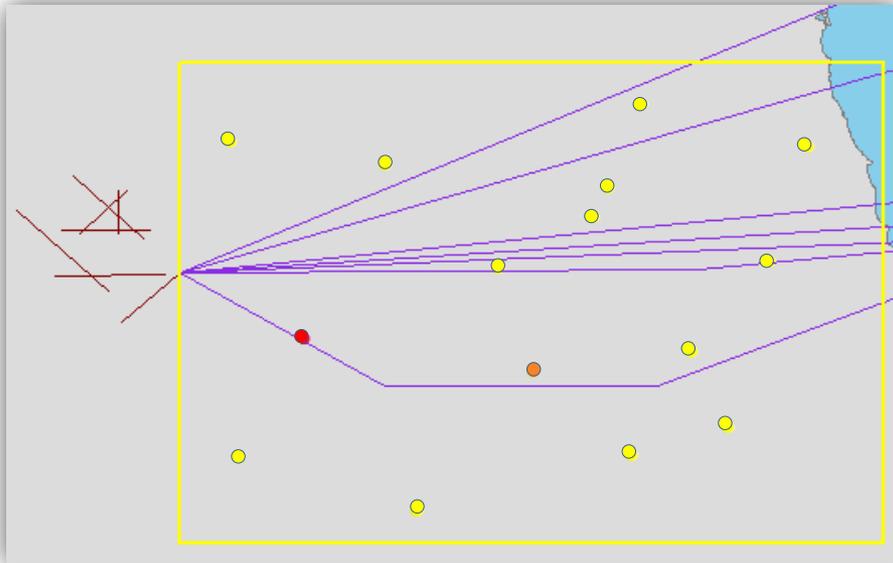
Baseline vs. (Proposed) Alternative



Noise Exposure Comparisons

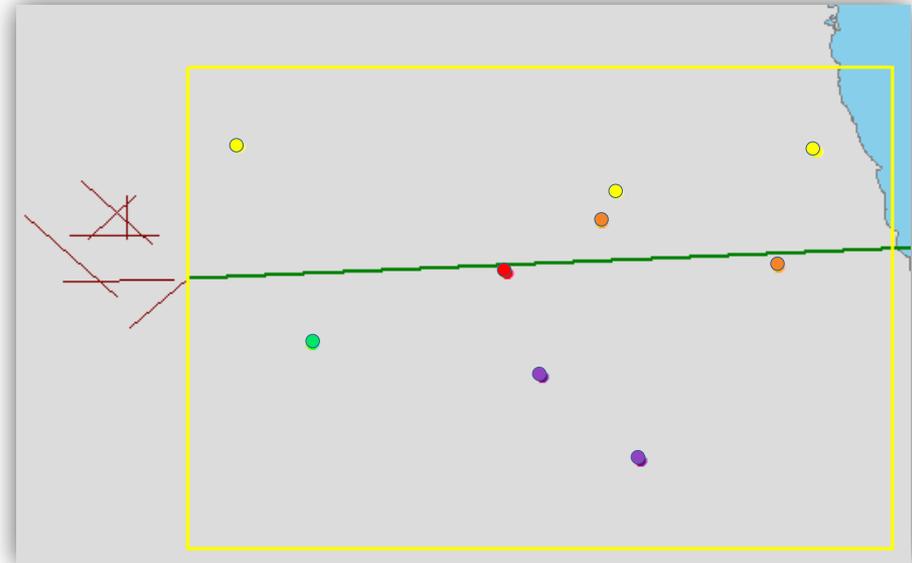
Original

Baseline vs. Alternative (growth)



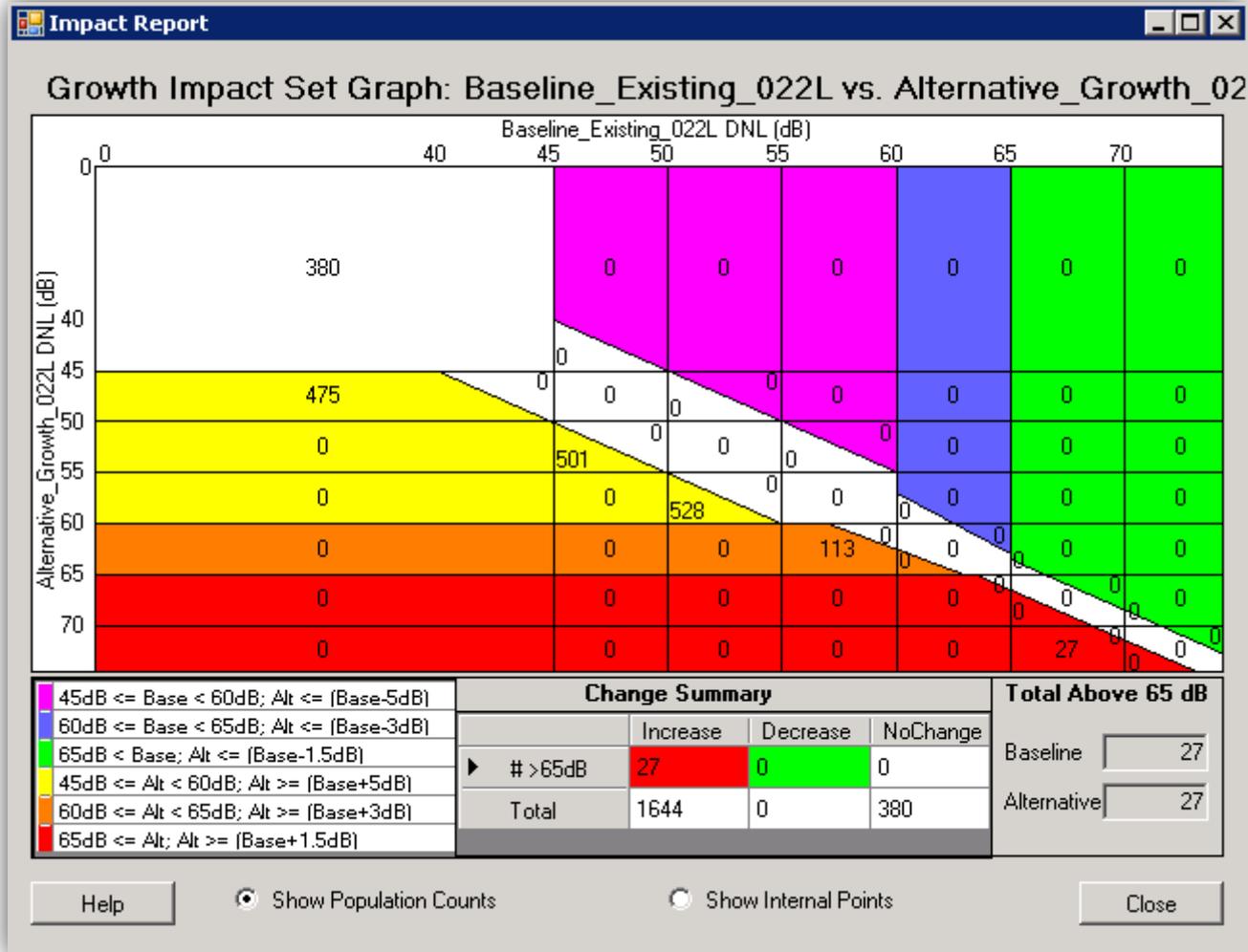
Proposed

Baseline vs. Alternative (growth with proposed tracks)



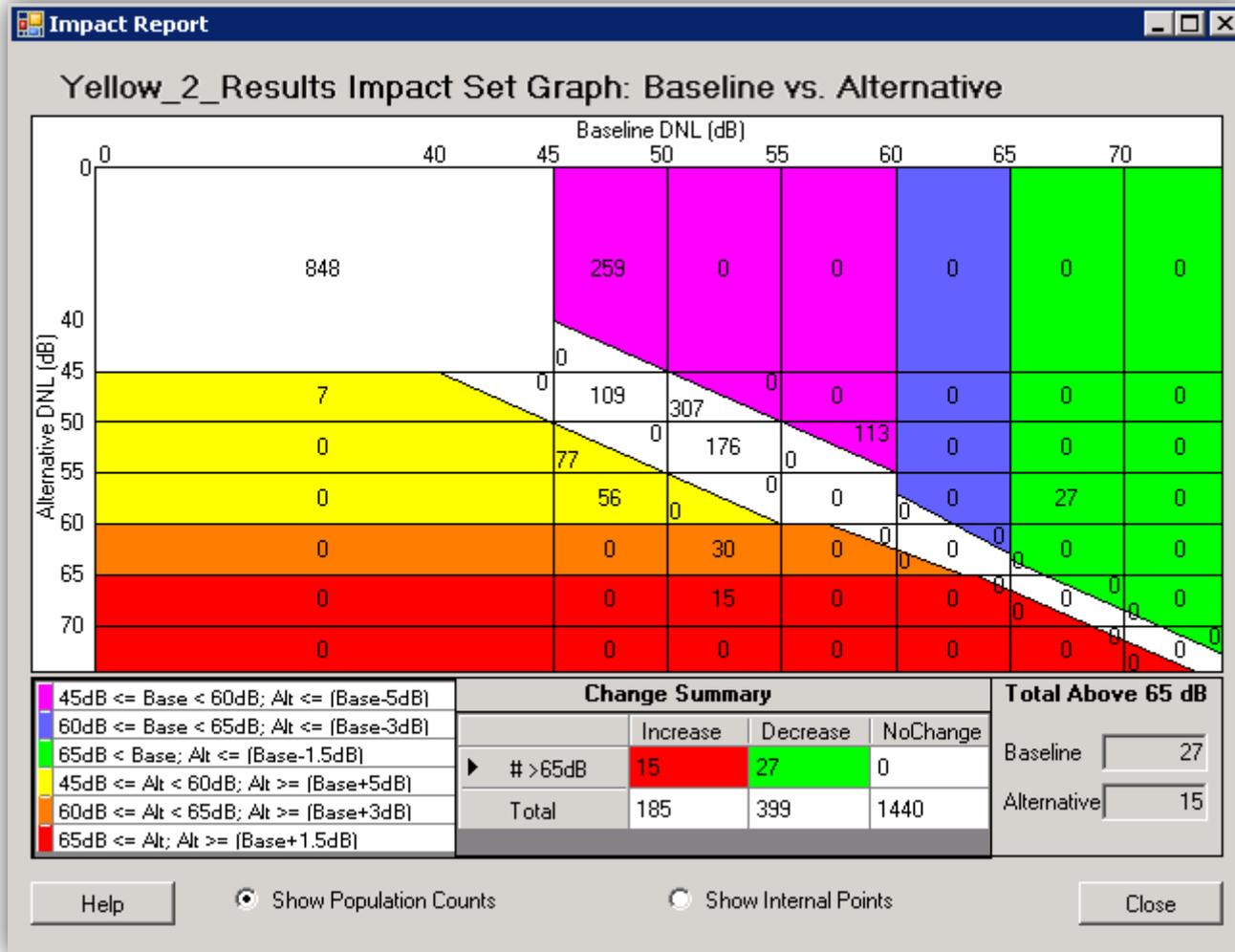
Impact Set Graph Comparison

Baseline (current) vs. Alternative (growth)



Impact Set Graph Comparison

Baseline (current) vs. Alternative (growth with proposed tracks)



Conclusions

Analysis Summary

- ❑ Growth with current track configuration
 - 1,644 people: significant noise exposure
 - 0 people: noise reduction
- ❑ Growth with proposed track configuration
 - 185 people: significant noise exposure
 - 1,440 people: noise reduction
 - 0.3% reduction in fuel burn
 - 0.23% reduction in NO_x
 - 0.53% reduction in CO

Modeling with AEDT2a

- ❑ Environmental interdependencies and consequences
 - Noise
 - Fuel burn
 - Local air quality
 - Greenhouse gas emissions
- ❑ More complete information for policymakers

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Questions?

Questions?

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Backup Slides

Impact Evaluation

Change Analysis | Impact Evaluation

Impact Evaluation
Session: Save

ImpactSet: Growth
ChangeZone: YELLOW Zone

Alternative Cases
62.9: Top Group:Annualization Group ✕
37.1: Top Group:Annualization Group ✕

Operations							Tracks				
%Contribution	DplD	ACType	NumOps	SEL	TrackName	NewTrack	TrackName	RunwayEnd	AirportLayout	Operations	NewOps
1.91	T1.3	757PW	1	3.401932E+009	T1 (11)	T1alt (21)	T1 (1)	22L	ORD(3)		
1.91	T1.2	757PW	1	3.401932E+009	T1 (11)	T1alt (21)	T2 (2)	22L	ORD(3)		
1.91	T1.4	757PW	1	3.401932E+009	T1 (11)	T1alt (21)	T3 (3)	22L	ORD(3)		
3.07	T1.b	LEAR35	1	5.454776E+009	T1 (11)	T1alt (21)	T4 (4)	22L	ORD(3)		
5.50	T1.5	737300	1	9.779689E+009	T1 (11)	T1alt (21)	T5 (5)	22L	ORD(3)		
5.50	T1.7	737300	1	9.779689E+009	T1 (11)	T1alt (21)	T6 (6)	22L	ORD(3)		
8.46	T1.6	777300	1	1.505223E+010	T2 (12)	T2alt (22)	T7 (7)	22L	ORD(3)		
8.46	T1.c	777300	1	1.505223E+010	T2 (12)	T2alt (22)	T8 (8)	22L	ORD(3)		
8.46	T1.1	777300	1	1.505223E+010	T2 (12)	T2alt (22)	T9 (9)	22L	ORD(3)		
8.46	T1.9	777300	1	1.505223E+010	T2 (12)	T2alt (22)	T10 (10)	22L	ORD(3)		
1.86	T5.2	757PW	1	3.307642E+009	T3 (13)	T3alt (23)	T11 (11)	22L	ORD(3)	T1.2, T1.3, T1.4,...	
14.15	T5.1	DC1040	1	2.517067E+010	T3 (13)	T3alt (23)	T2 (12)	22L	ORD(3)	T1.c, T1.9, T1.1,...	
1.77	T5.0	757PW	1	3.148651E+009	T3 (13)	T3alt (23)	T3 (13)	22L	ORD(3)	T5.0, T5.1, T5.2,...	
4.71	T5.5	737300	1	8.377062E+009	T3 (13)	T3alt (23)	T4 (14)	22L	ORD(3)	T5.6, T5.4	
5.08	T5.6	777300	1	9.043040E+009	T4 (14)	T4alt (24)	T5 (15)	22L	ORD(3)	T0.4, T0.3, T0.1,...	
5.08	T5.4	777300	1	9.043040E+009	T4 (14)	T4alt (24)	T6 (16)	22L	ORD(3)	T0.0	
3.18	T0.3	DC870	1	5.664164E+009	T5 (15)	T5alt (25)	T7 (17)	22L	ORD(3)		
0.60	T0.4	757PW	1	1.062063E+009	T5 (15)	T5alt (25)	T8 (18)	22L	ORD(3)	T4	
2.28	T0.1	767J19	1	4.049741E+009	T5 (15)	T5alt (25)	T9 (19)	22L	ORD(3)		
2.03	T0.2	737300	1	3.606094E+009	T5 (15)	T5alt (25)	T10 (20)	22L	ORD(3)		
2.73	T0.0	777300	1	4.857992E+009	T6 (16)	T6alt (26)	T1alt (21)	22L	ORD(3)		T1.7, T1.5, T1.b,...
2.86	T4	F10065	1	5.080411E+009	T8 (18)	T8alt (28)	T2alt (22)	22L	ORD(3)		T1.9, T1.1, T1.c,...
							T3alt (23)	22L	ORD(3)		T5.5, T5.0, T5.1,...
							T4alt (24)	22L	ORD(3)		T5.4, T5.6
							T5alt (25)	22L	ORD(3)		T0.2, T0.1, T0.4,...
							T6alt (26)	22L	ORD(3)		T0.0
							T7alt (27)	22L	ORD(3)		
							T8alt (28)	22L	ORD(3)		T4
							T9alt (29)	22L	ORD(3)		
							T10alt (30)	22L	ORD(3)		