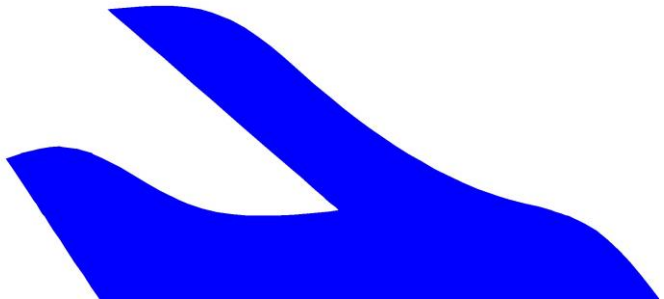
Aircraft Operations and Noise Exposure Monthly Report

May 2022



vianair

airspace design made easy

Project Overview

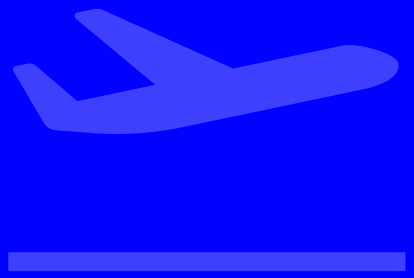
The growth in operations at BWI brings number social and economic impacts to communities surrounding the airport, however, this also results in significant noise impacts, especially for residents of Anne Arundel and Howard counties.

Howard and Anne Arundel Counties hired Vianair to help analyze flight activity in and out of Baltimore/Washington International Airport (BWI). In coordination with representatives from the two counties and support from the BWI Roundtable, Vianair developed the following report which includes the analysis of key elements (operational and acoustic elements) to help the community understand the existing noise exposure and to provide the ability to track changes over time.

While comprehensive, the elements in the report were selected by those who contributed to the report development (representatives from the two counties and the BWI Roundtable).

This report will be published monthly, beginning with March 2022. Report content may change based on input from the contributors and/or the community.

AIRPORT OPERATIONS DATA



Airport Operations Data

Aircraft operations (arrivals and departures) are the source for aircraft noise exposure for communities around BWI. While aircraft noise is the primary concern for most residents, it is important to understand aircraft operations in addition to analyzing aircraft noise. Changes in airport operations (which runways are used, predominant flight paths and routes, etc., affect community noise exposure and these can change over time.

The core operational data sets analyzed in this report include Runway Use and Flight Track Density. Additional, or supplemental operational analyses are included in Appendix I. These include total (daily) operations, operations by aircraft type, daytime versus nighttime operations, and total operations.

Runway Use

BWI has six runways: 10, 15R, 15L, 28, 33R, and 33L. Runway selection is based primarily on wind direction. BWI operates in two flows. When winds are out of the east, aircraft will arrive and depart in an EAST FLOW and when winds are out of the west, aircraft will arrive and depart in a WEST FLOW. Aircraft noise levels vary when below an aircraft landing or taking-off. Runway use also influences routes to and from the airport, which also affects aircraft noise for communities below.

EAST FLOW

WEST FLOW

vianair

Runway Use

Runway use is analyzed each month. Operations are broken up into arrivals (landings) and departures (take-offs). This information is presented in two ways, first over an airport aerial map, then using bar graphs.

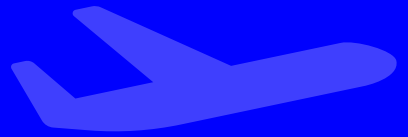
The red arrows in the graphic below depict the percentage of total arrivals for the month. The green arrows in the graphic indicate the percentage of total departures for the month.

The graphics above are for illustrative purposes only. The actual monthly data will be presented later in the report.

vianair

AIRPORT OPERATIONS DATA

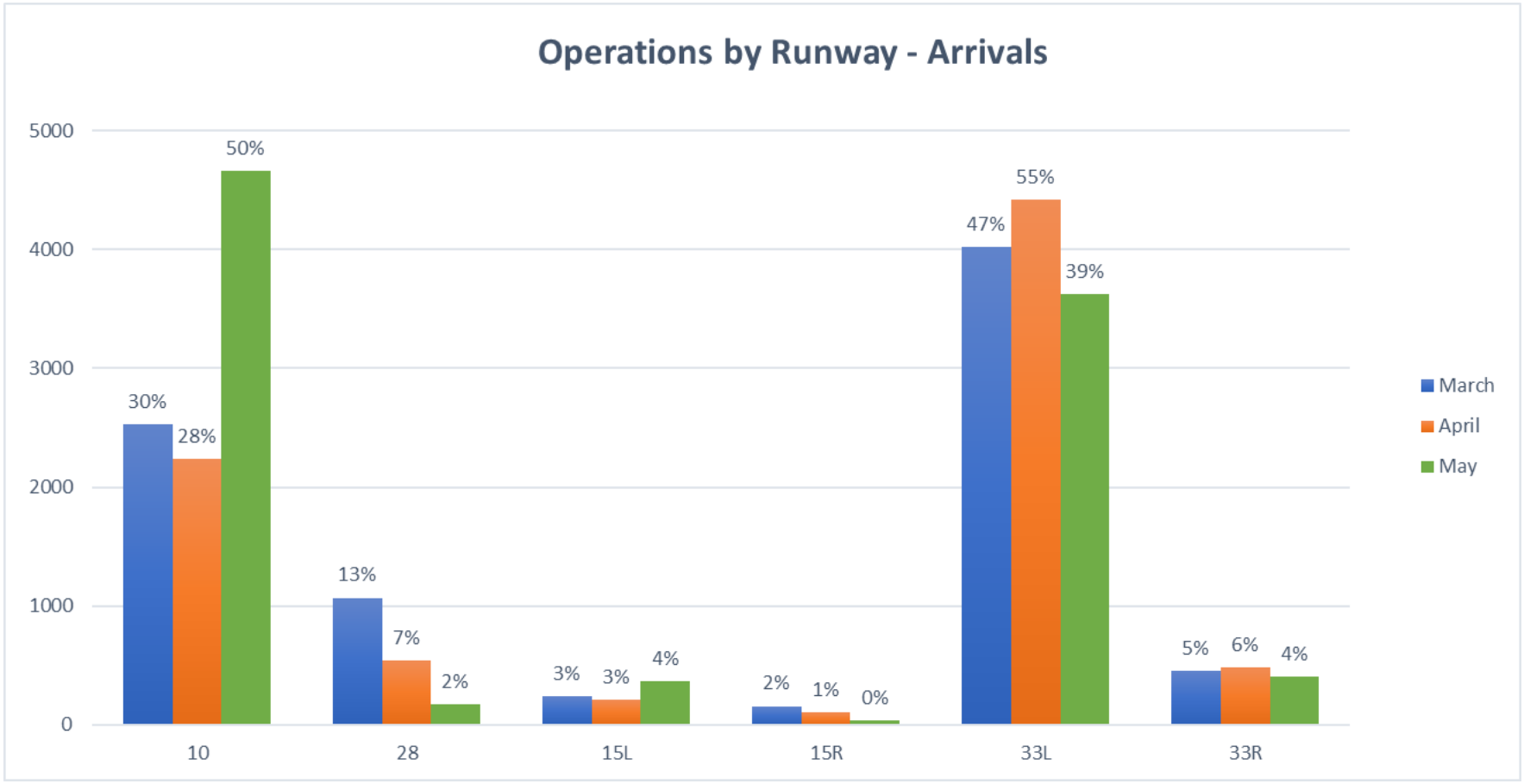
Monthly Data



Runway Use - Arrivals

vianair

Runway Use - Arrivals

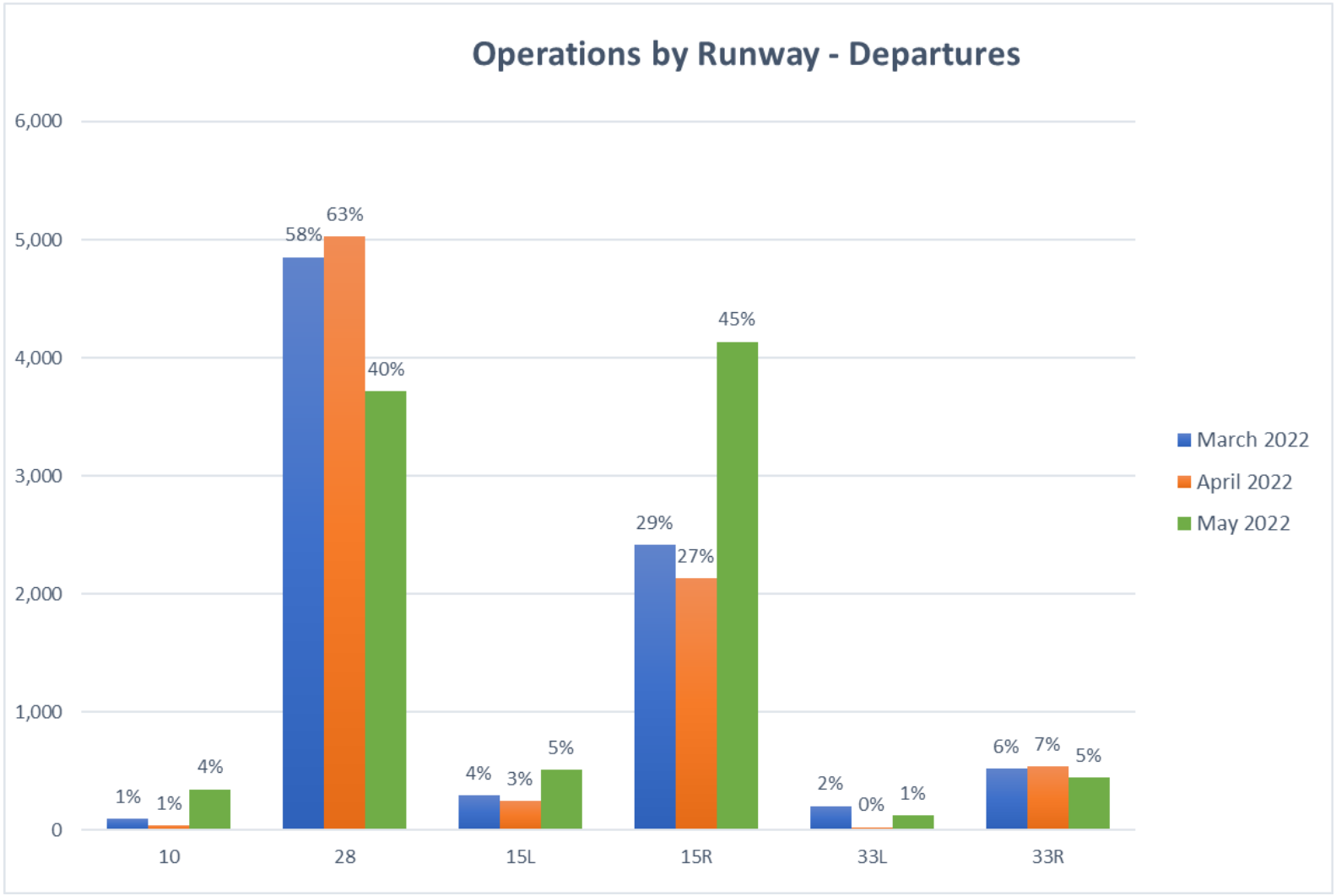


vianair

Runway Use - Departures

vianair

Runway Use - Departures



vianair

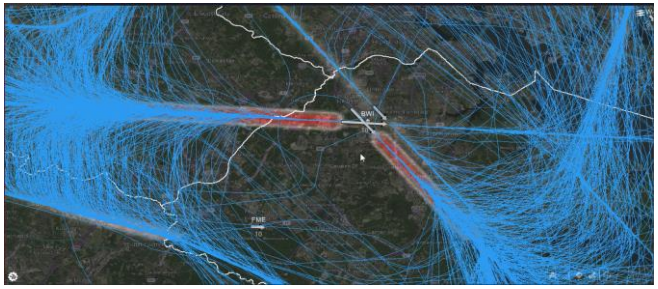
Density Analyses

Flight paths to and from the airport will vary based on a number of factors, including weather conditions, runway, flight procedure, aircraft type, and air traffic conditions.

Flight track density analyzes the concentrations of flight activity in and out of BWI. Flight track density is calculated based on reviewing all flights for the month, then analyzing the concentration of flights within the study area. Concentration (or density) is then depicted using color. Red represents the highest density, fading to white as density lowers.

Noise data was added to the density analyses. The noise exposure is based on the "Number-of-Events-Above" metric, which is described in detail on Slides 28-29.

All Flight Tracks



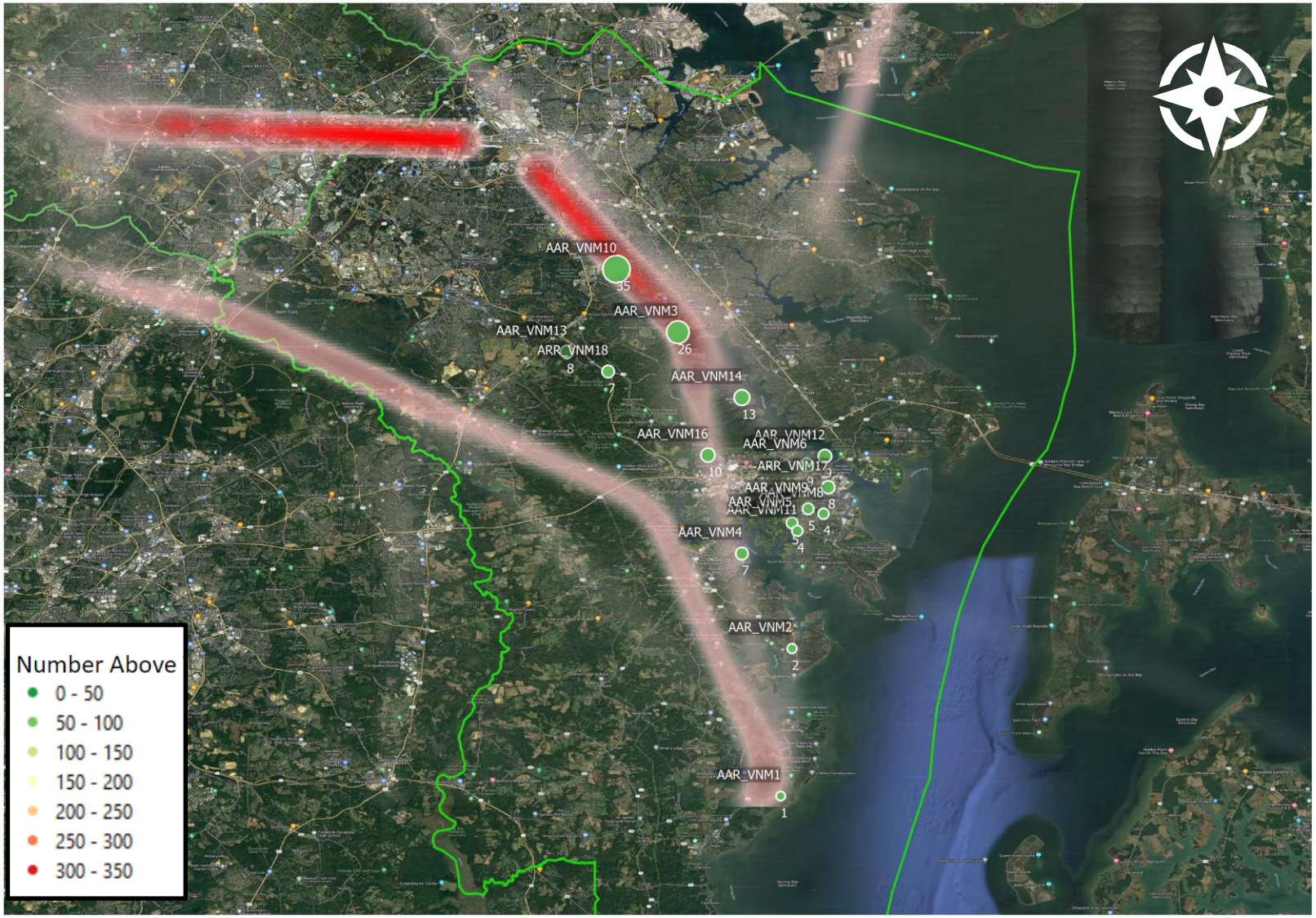
Converting Tracks to Density

Density Analysis

vianair

Flight Track Density Analysis – Arrivals (with NA55)

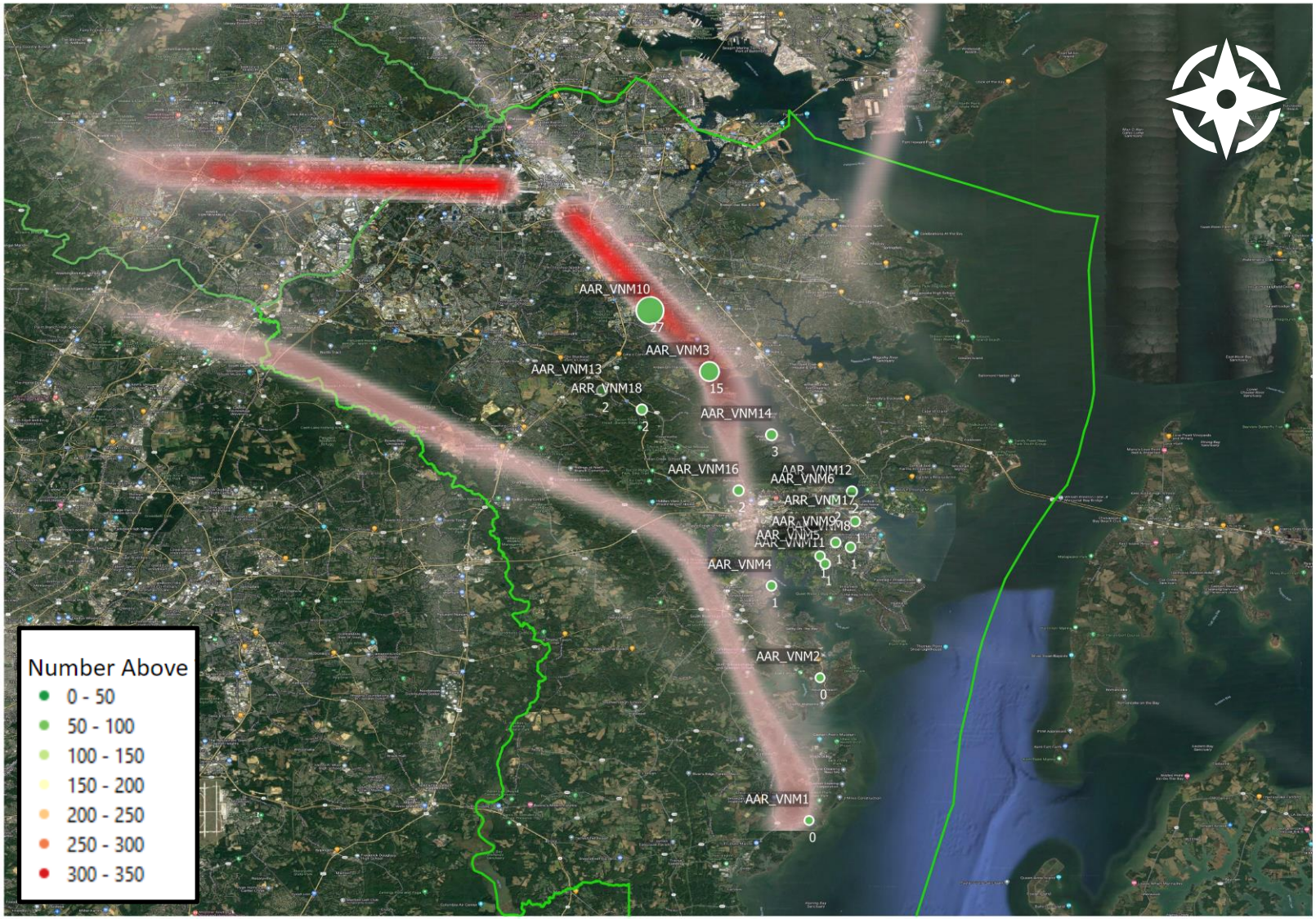
Anne Arundel County



vianair

Flight Track Density Analysis – Arrivals (with NA65)

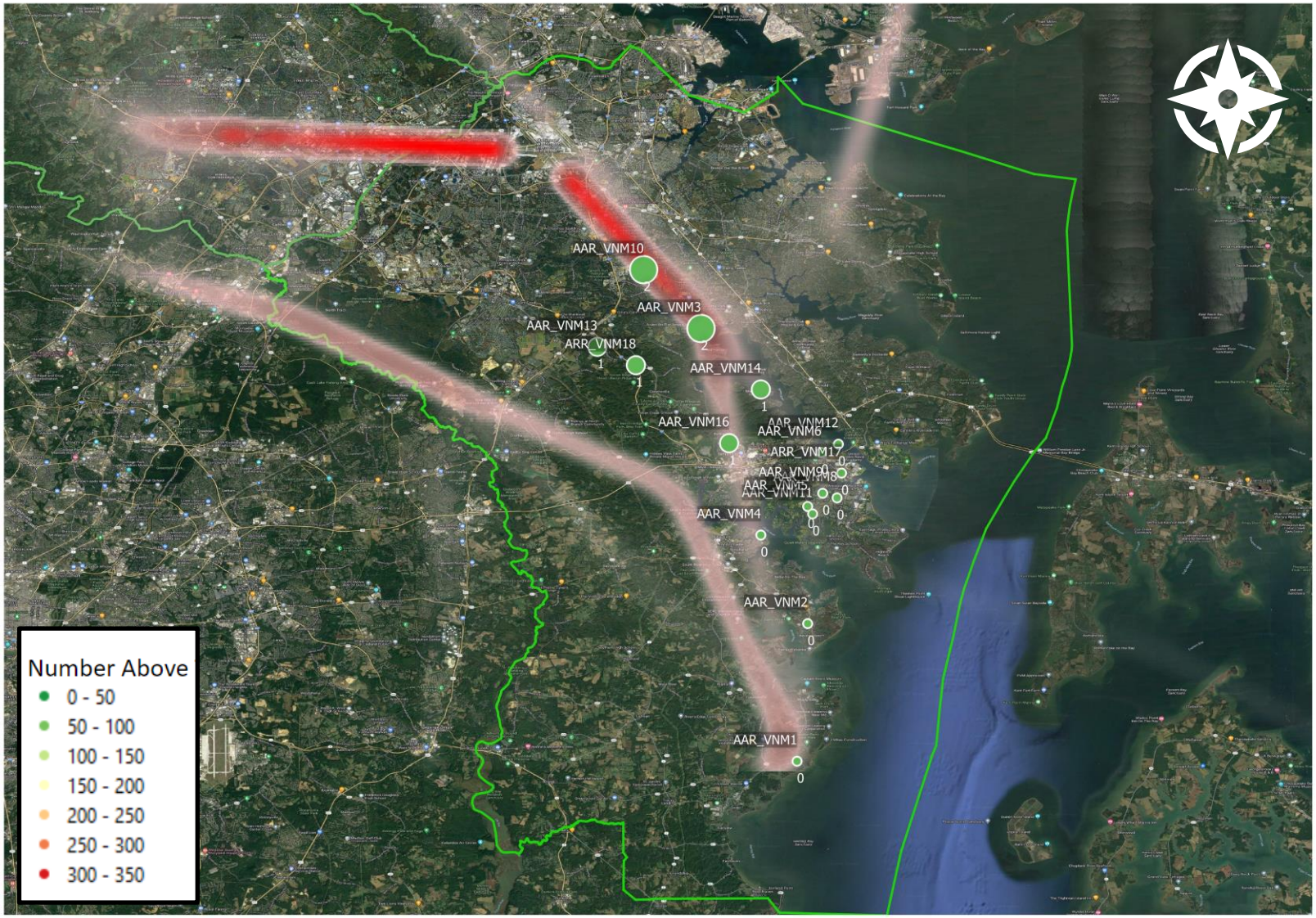
Anne Arundel County



vianair

Flight Track Density Analysis – Arrivals (with NA75)

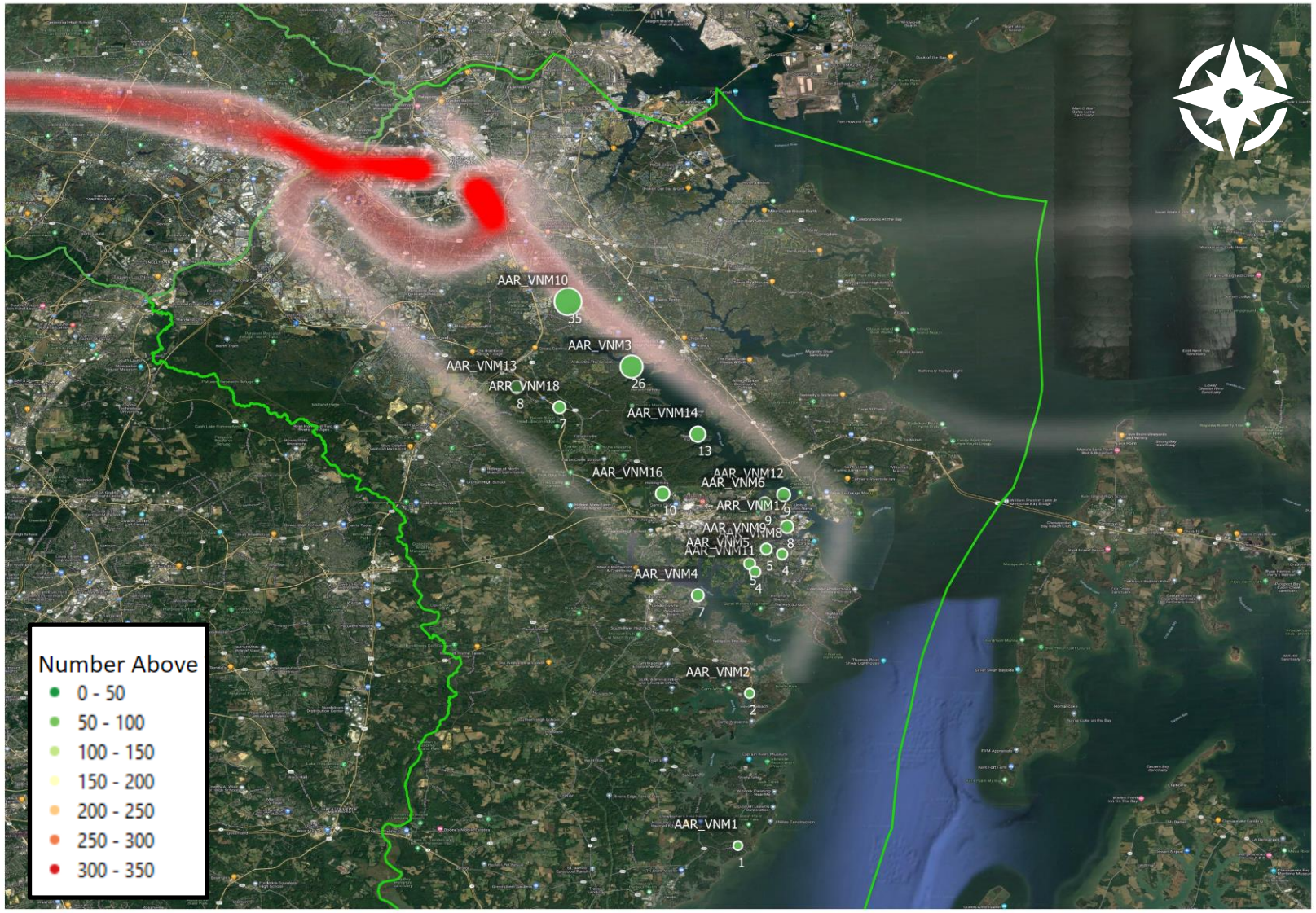
Anne Arundel County



vianair

Flight Track Density Analysis – Departures (with NA55)

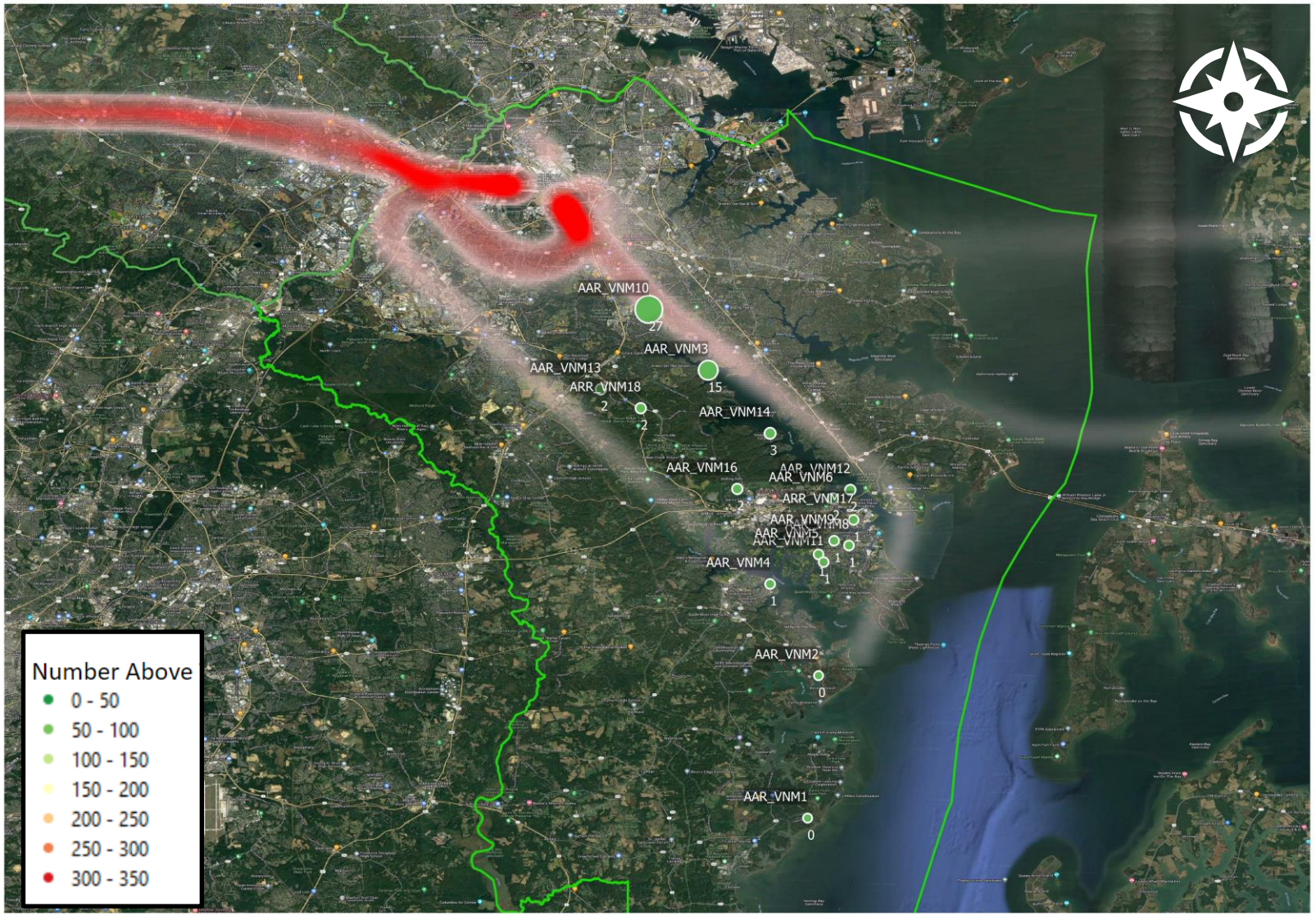
Anne Arundel County



vianair

Flight Track Density Analysis – Departures (with NA65)

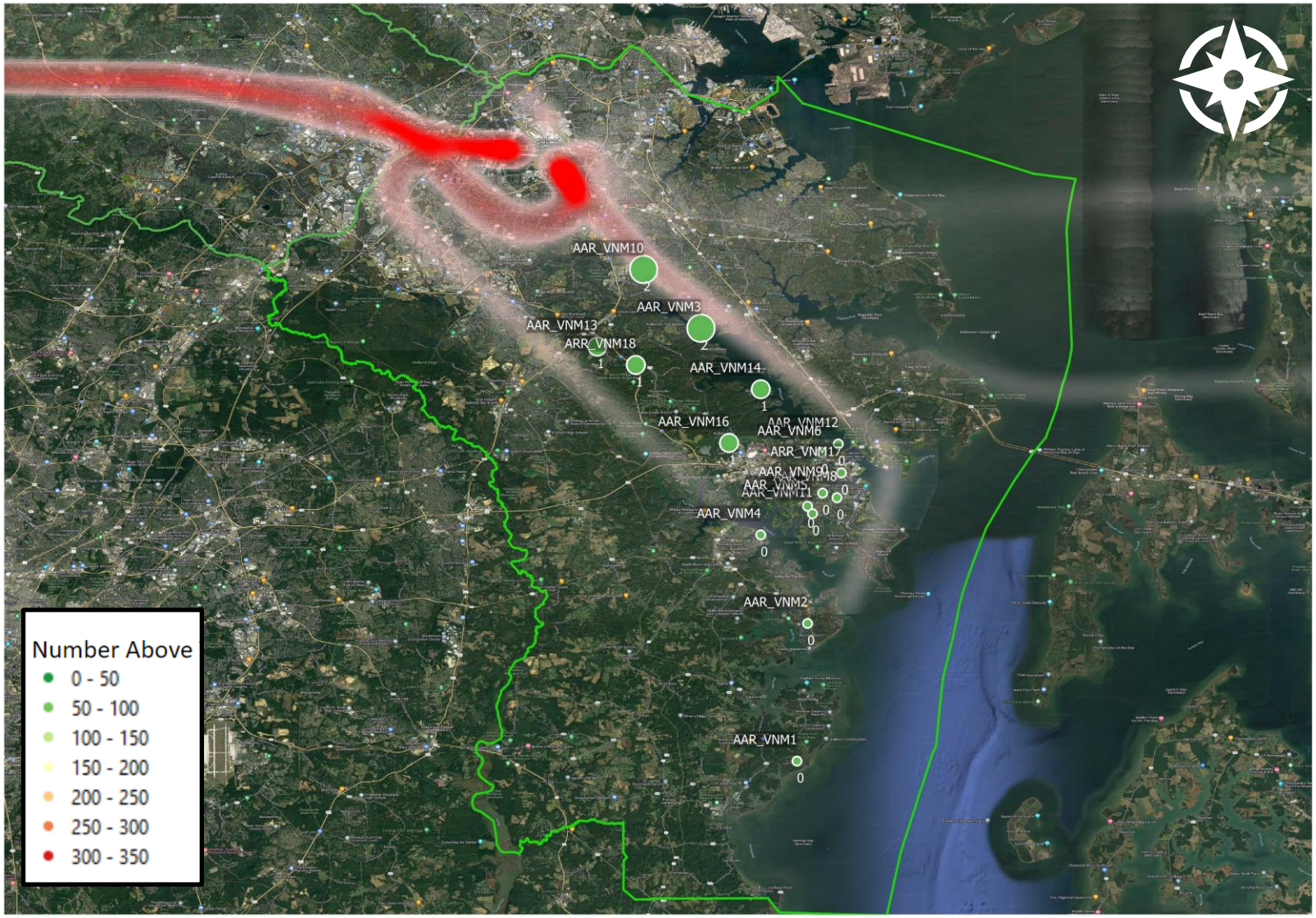
Anne Arundel County



vianair

Flight Track Density Analysis – Departures (with NA75)

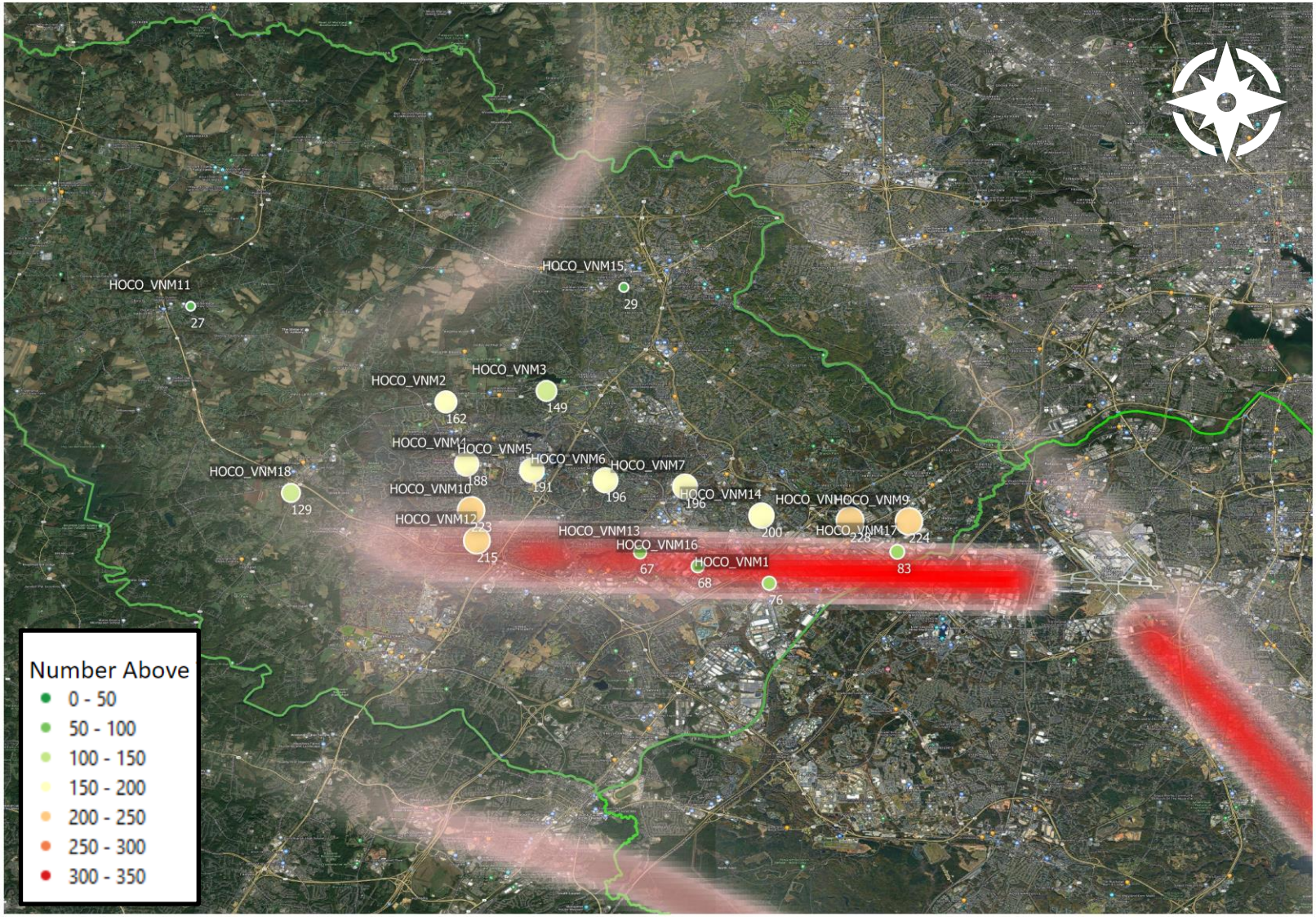
Anne Arundel County



vianair

Flight Track Density Analysis – Arrivals (with NA55)

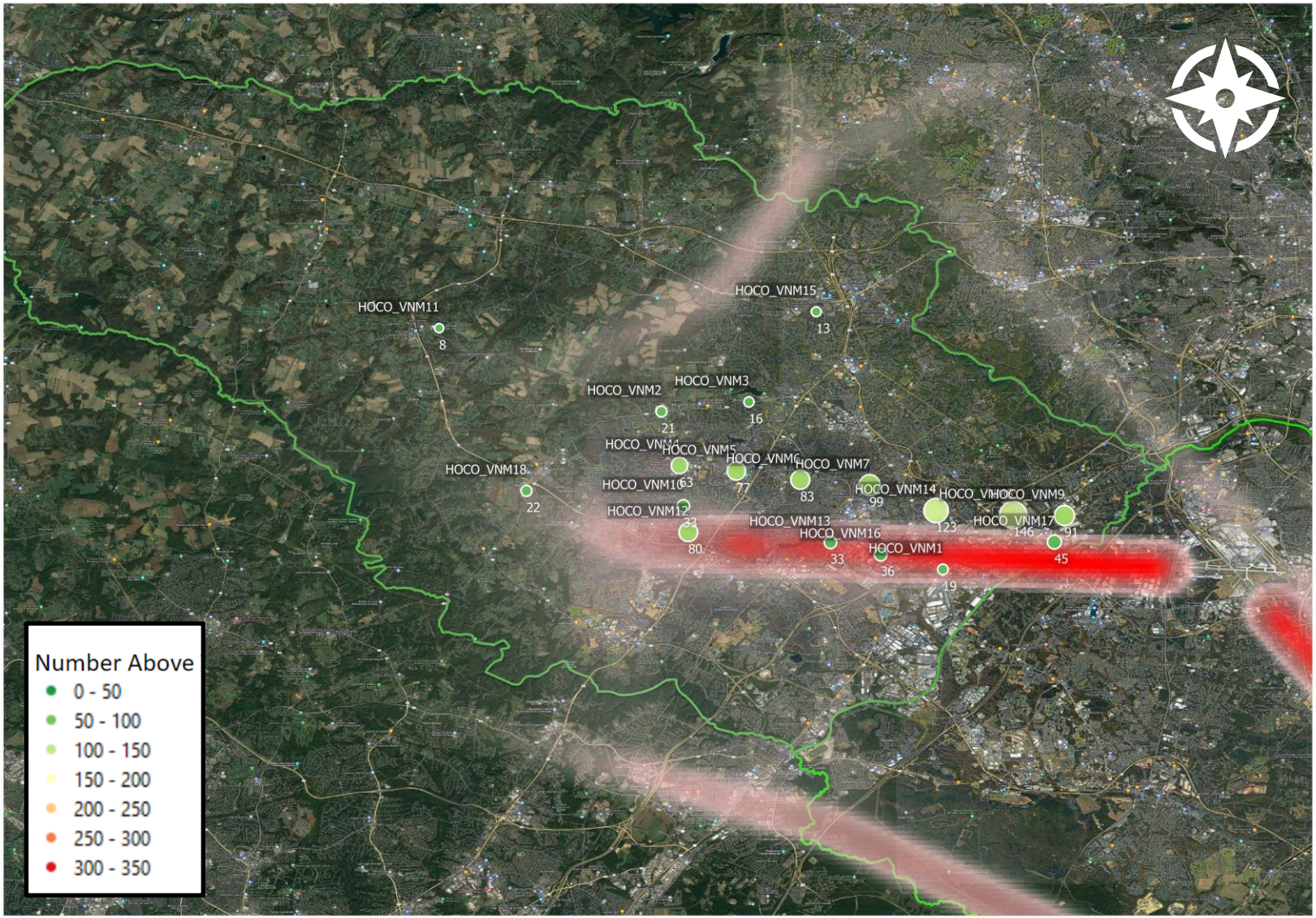
Howard County



vianair

Flight Track Density Analysis – Arrivals (with NA65)

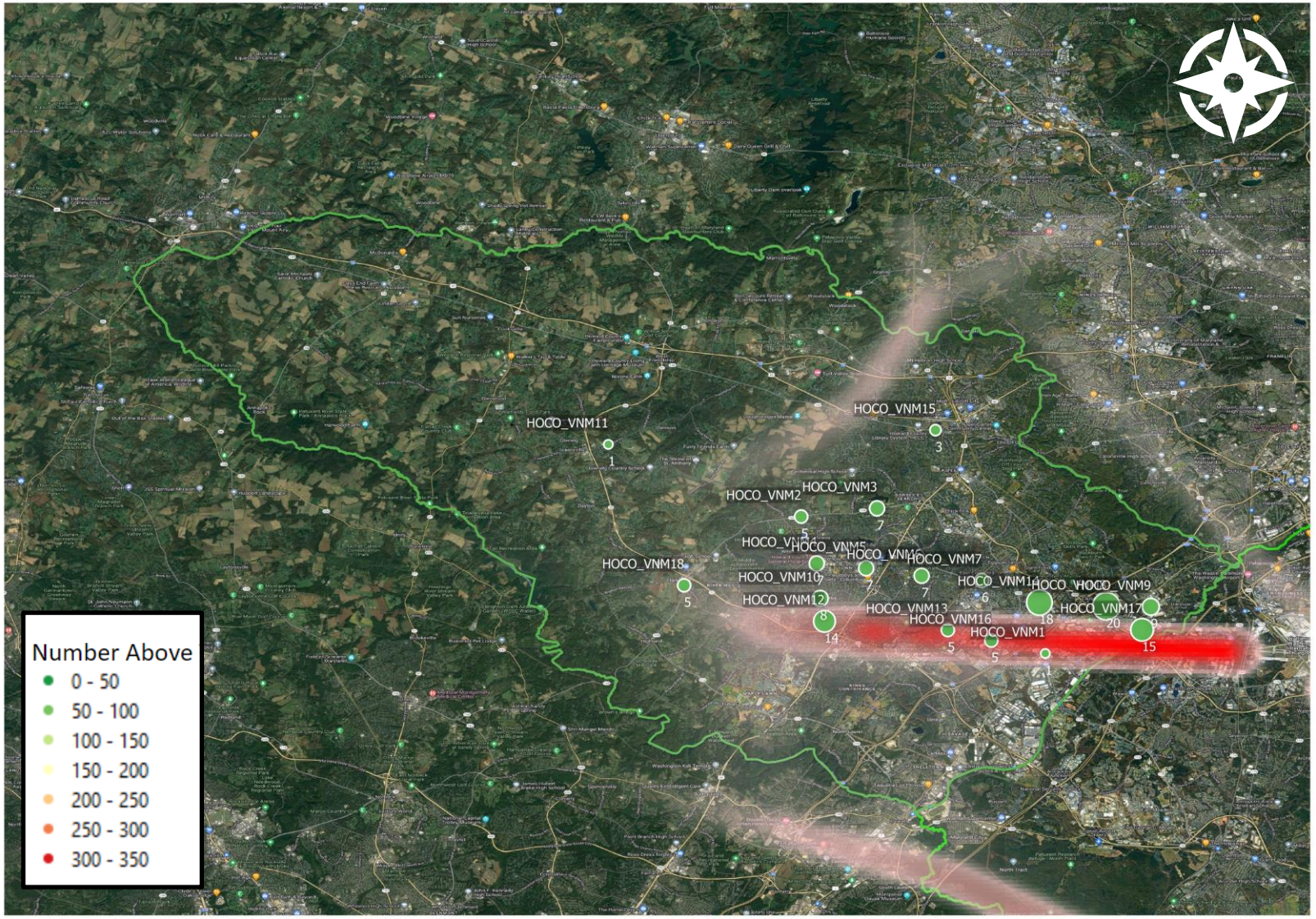
Howard County



vianair

Flight Track Density Analysis – Arrivals (with NA75)

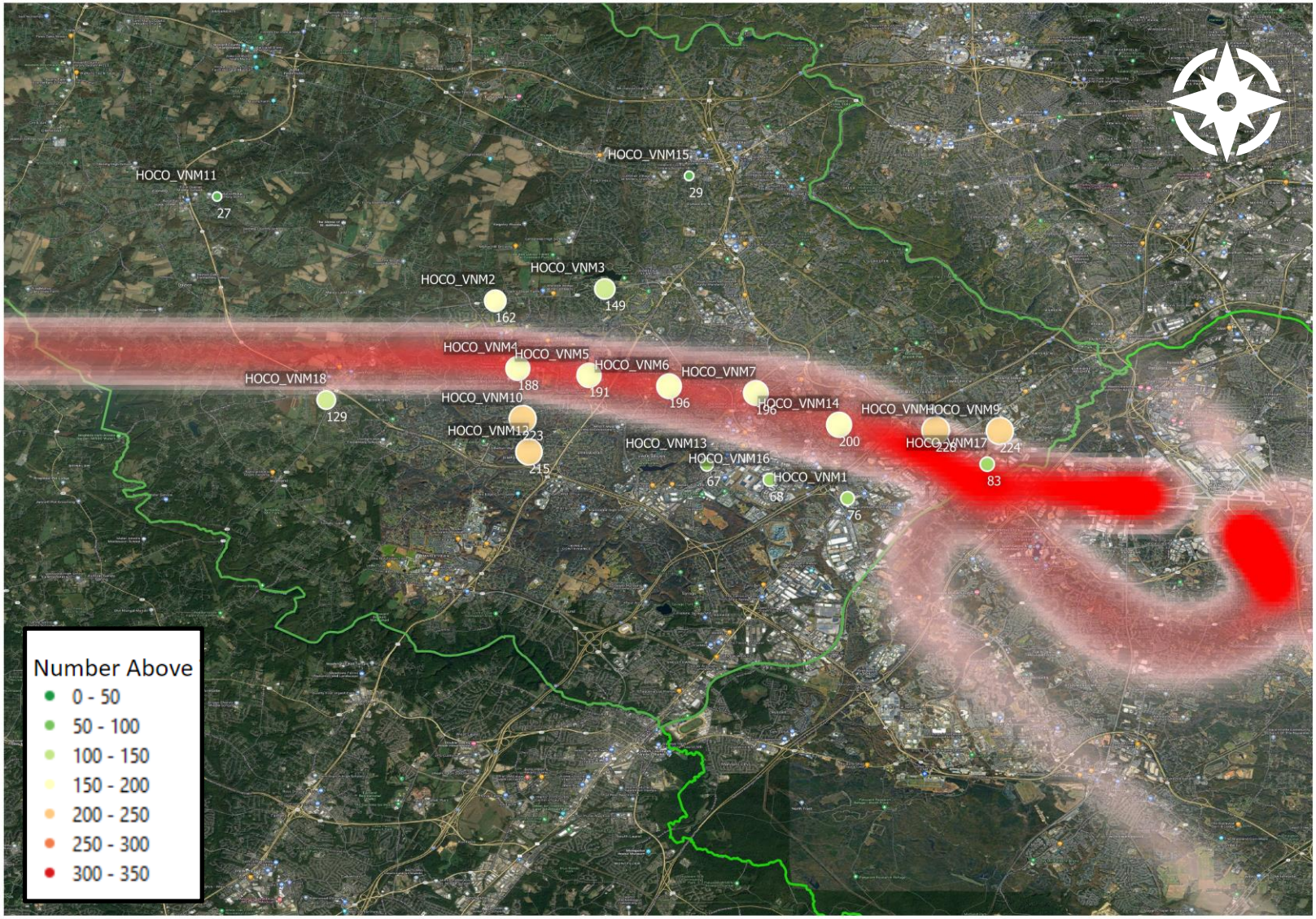
Howard County



vianair

Flight Track Density Analysis – Departures (with NA55)

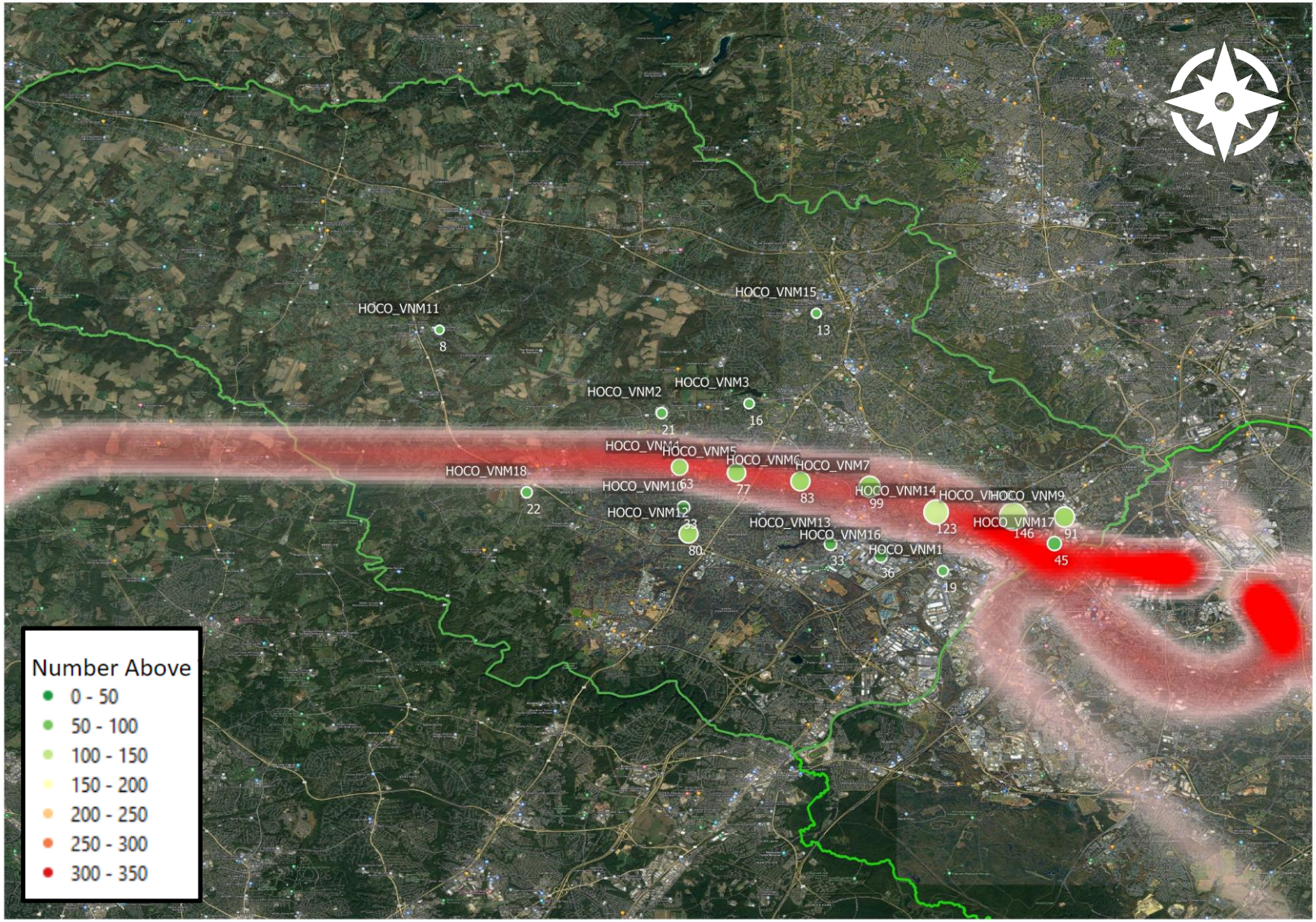
Howard County



vianair

Flight Track Density Analysis – Departures (with NA65)

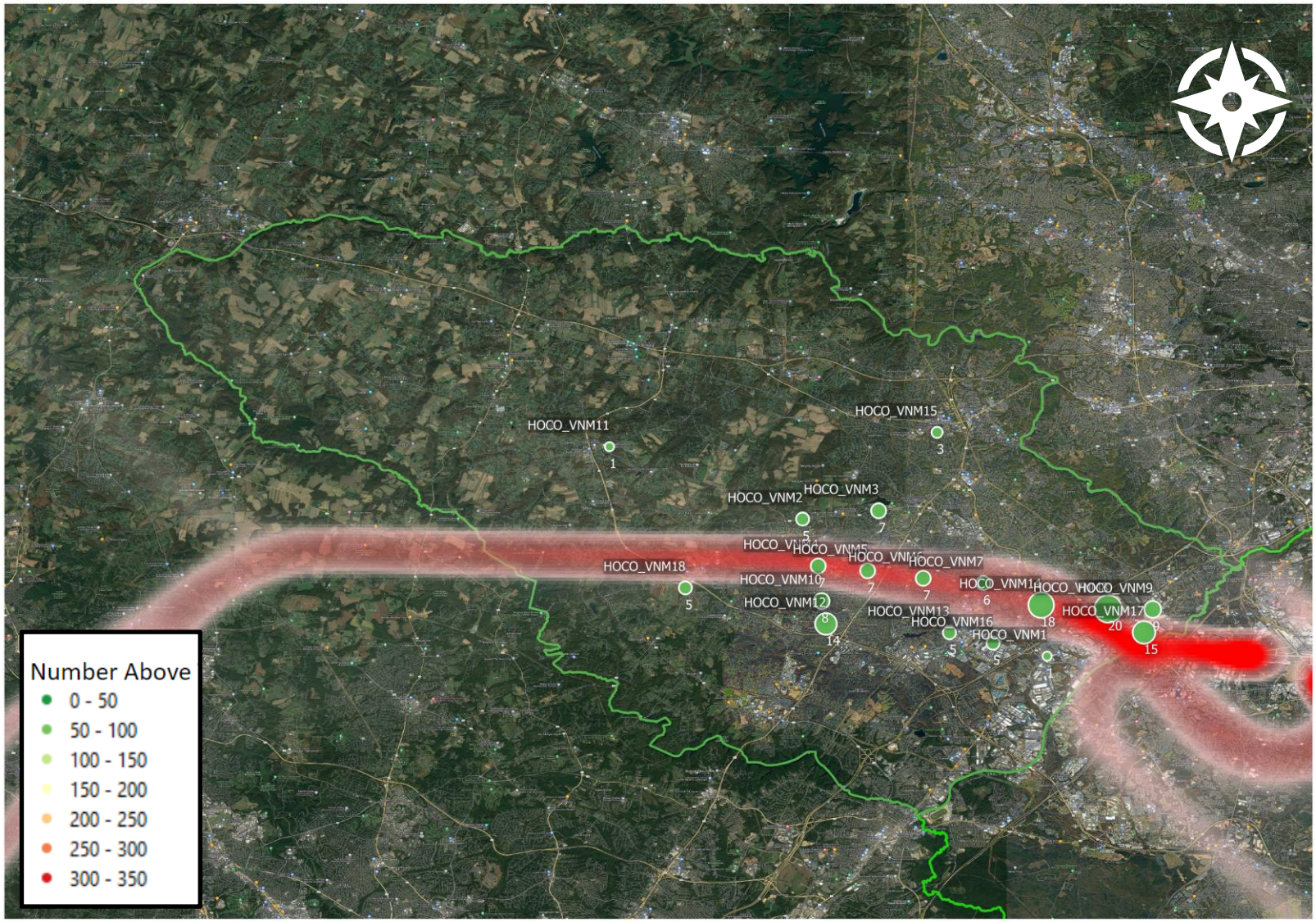
Howard County



vianair

Flight Track Density Analysis – Departures (with NA75)

Howard County



vianair

NOISE EXPOSURE

Virtual Noise Analysis - Introduction

Noise Analysis - Overview

BWI maintains noise monitors deployed in communities surrounding the airport. Noise monitors are very effective at collecting aircraft noise data, however, there are limitations.

For this project, Vianair is using noise modelling technology that calculates noise based on aircraft operations. Flight data is collected from the Federal Aviation Administration. This data (primarily radar data) is processed by the Vianair software platform and computes the noise exposure along the flight path. Calculations incorporate aircraft type, altitude, airspeed, etc. The noise modelling and analysis technology used by Vianair is consistent with that used by the Federal Aviation Administration and aviation regulators worldwide. The Vianair software platform uses the same algorithms used by the FAA's Aviation Environmental Design Tool (AEDT) which is a global standard for aircraft noise modelling and analyses.

vianair

Noise Analysis - Overview

Noise monitoring allows more flexibility and the selection of locations for which to analyze aircraft noise. While BWI hosts 16 monitors, for this analysis, a grid was established with a total of 89 monitors covering most of Anne Arundel and Howard Counties. An additional 36 locations were selected, representing specific areas of interest or "landmarks". This results in a total of 125 discrete locations for which aircraft noise data is collected and analyzed. These locations are referred to as "virtual noise monitor locations" in this report.

vianair

Noise Exposure - Overview

Noise is defined as “unwanted sound.” There are many ways to measure noise. Two common metrics will be used in these reports: Day-Night Level (DNL) and Number-of-Events-Above (NA).

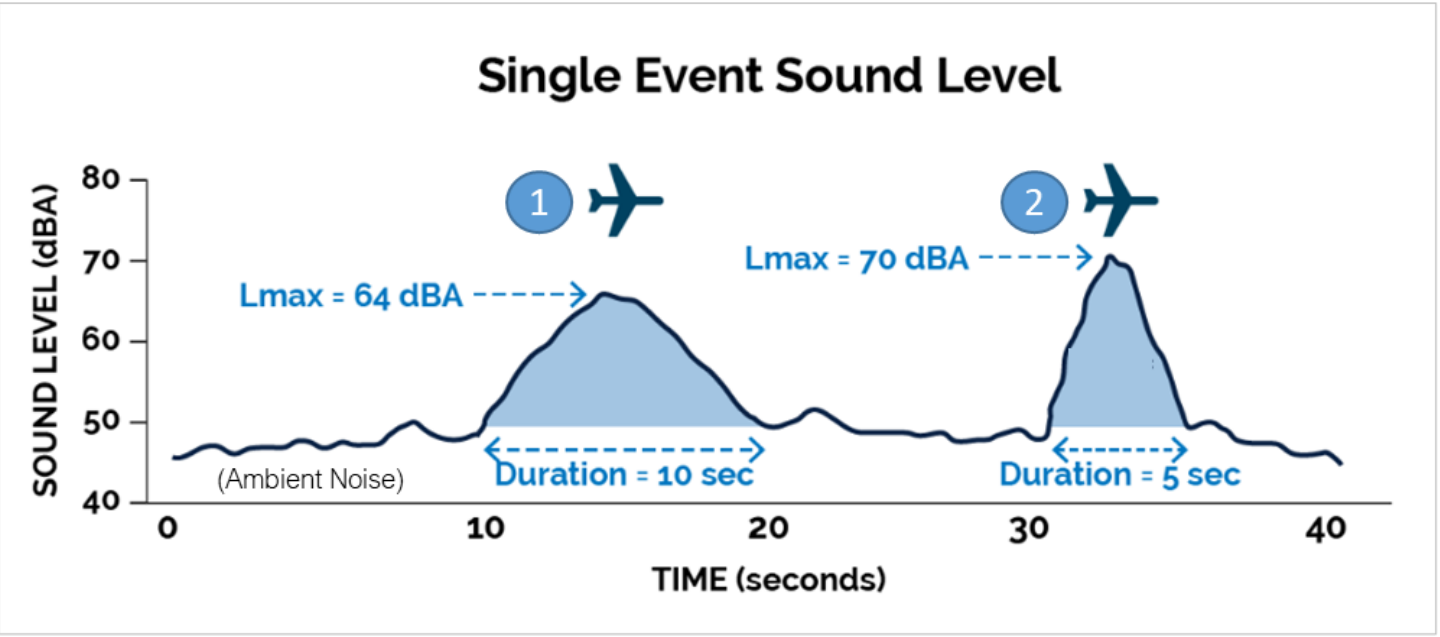
DNL is the standard metric used by the Federal Aviation Administration as required by federal regulation. The problem with DNL is it is difficult to understand and doesn’t seem to reflect what residents experience on a daily basis.

The Number-of-Events-Above metric calculates the number of times an aircraft overflight exceeds a specific maximum noise level. For this report, events above 55 decibels, 65 decibels, and 75 decibels were selected. This will indicate how many times aircraft noise exceeded 55, 65, or 75 decibels. These are calculated for the reporting month and daily average.

Number-of-Events-Above (NA) Metric

The graphic below represents two aircraft overflights/noise events. The maximum noise level of the first overflight was 64 decibels (shown as 64 dBA). The maximum noise level of the second event was 70 decibels (shown as 70 dBA).

The NA noise metric counts the number of times the noise level exceeds a specific threshold. In this report, 55, 65, and 75 decibels was selected.



Graphic adapted from *Aircraft Noise Overview*. Boston Logan RNAV (GPS) RWY 4L Environmental Assessment. March 2021. https://faabostonworkshops.com/project-information/aircraft-noise-overview/

vianair

Noise Levels

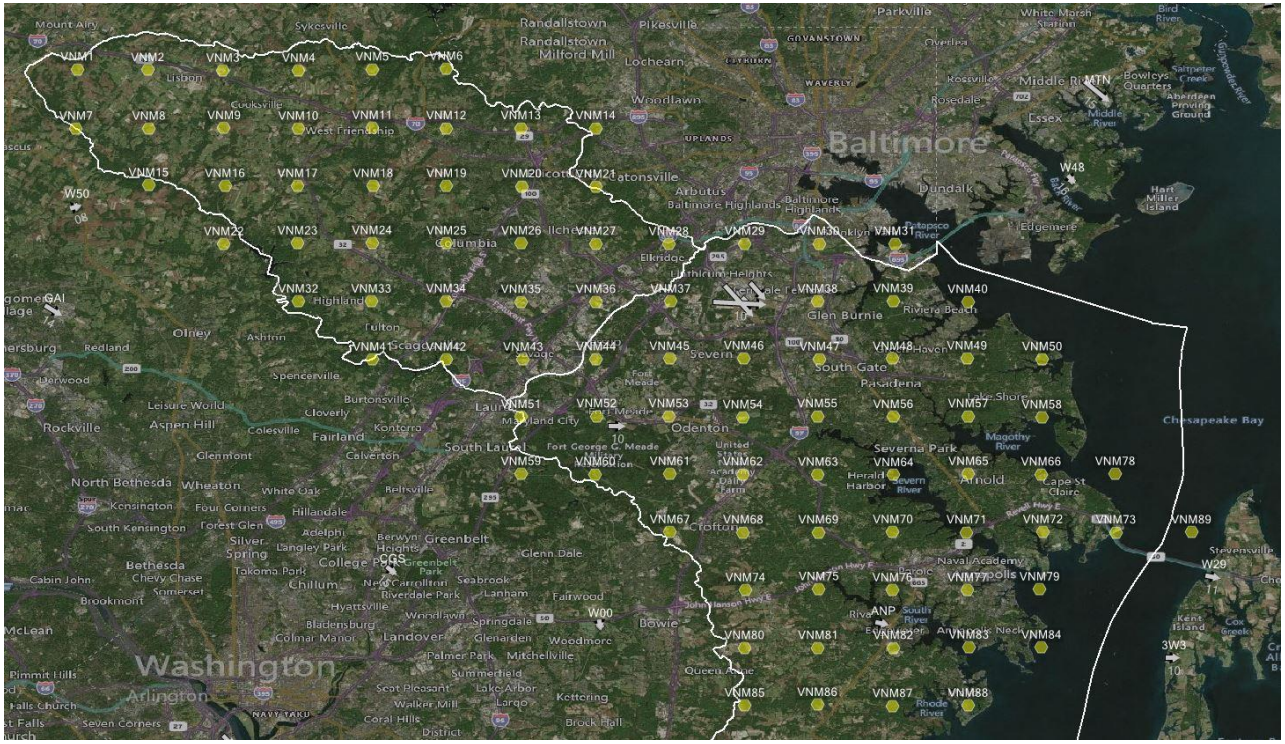
The scale below is intended to provide a basic understand of noise levels which are expressed in decibels (dB or dBA). As indicated, the typical sound level for people speaking (3 ft apart) is 64-65 decibels. Other common noise sources are also listed.

Source: Fundamentals of Noise and Sound. (n.d.). Retrieved July 2022, from https://www.faa.gov/regulations_policies/policy_guidance/noise/basics

Noise Exposure – Virtual Noise Monitor Locations

In order to provide ample coverage of the communities in both Anne Arundel and Howard Counties, a large grid was developed and applied to the two-county area. This resulted in complete coverage of the study area.

A map with the study grid, and the additional selected (landmark) locations are described in the following tables and graphics.



NOISE EXPOSURE

Virtual Noise Analysis – Monthly Data

Noise Exposure – Virtual Noise Monitor Locations

(89 Monitor Points - Two-County, 2.5 mile grid)

ID	Latitude	Longitude	Elevation
VNM61	39.05088	-76.722369	160
VNM62	39.050612	-76.669745	135
VNM63	39.050343	-76.615511	161
VNM64	39.050075	-76.561008	37
VNM65	39.05088	-76.507042	123
VNM66	39.050612	-76.454687	78
VNM67	39.008996	-76.722369	59
VNM68	39.008728	-76.669477	125
VNM69	39.008728	-76.615243	146
VNM70	39.008996	-76.561545	87
VNM71	39.008728	-76.508385	59
VNM72	39.008996	-76.453345	11
VNM73	39.008728	-76.400721	0
VNM74	38.967112	-76.667866	115
VNM75	38.967918	-76.614974	55
VNM76	38.967112	-76.561814	87
VNM77	38.967112	-76.507848	20
VNM78	39.05088	-76.401258	78
VNM79	38.967649	-76.455761	20
VNM80	38.925497	-76.668672	110

ID	Latitude	Longitude	Elevation
VNM81	38.925497	-76.615511	55
VNM82	38.925497	-76.561277	89
VNM83	38.925765	-76.506774	57
VNM84	38.925765	-76.454419	32
VNM85	38.883881	-76.668403	129
VNM86	38.884418	-76.616048	228
VNM87	38.883613	-76.561814	32
VNM88	38.883881	-76.507311	32
VNM89	39.008795	-76.346353	12

vianair

Noise Exposure – Virtual Noise Monitor Locations

(Landmark Locations)

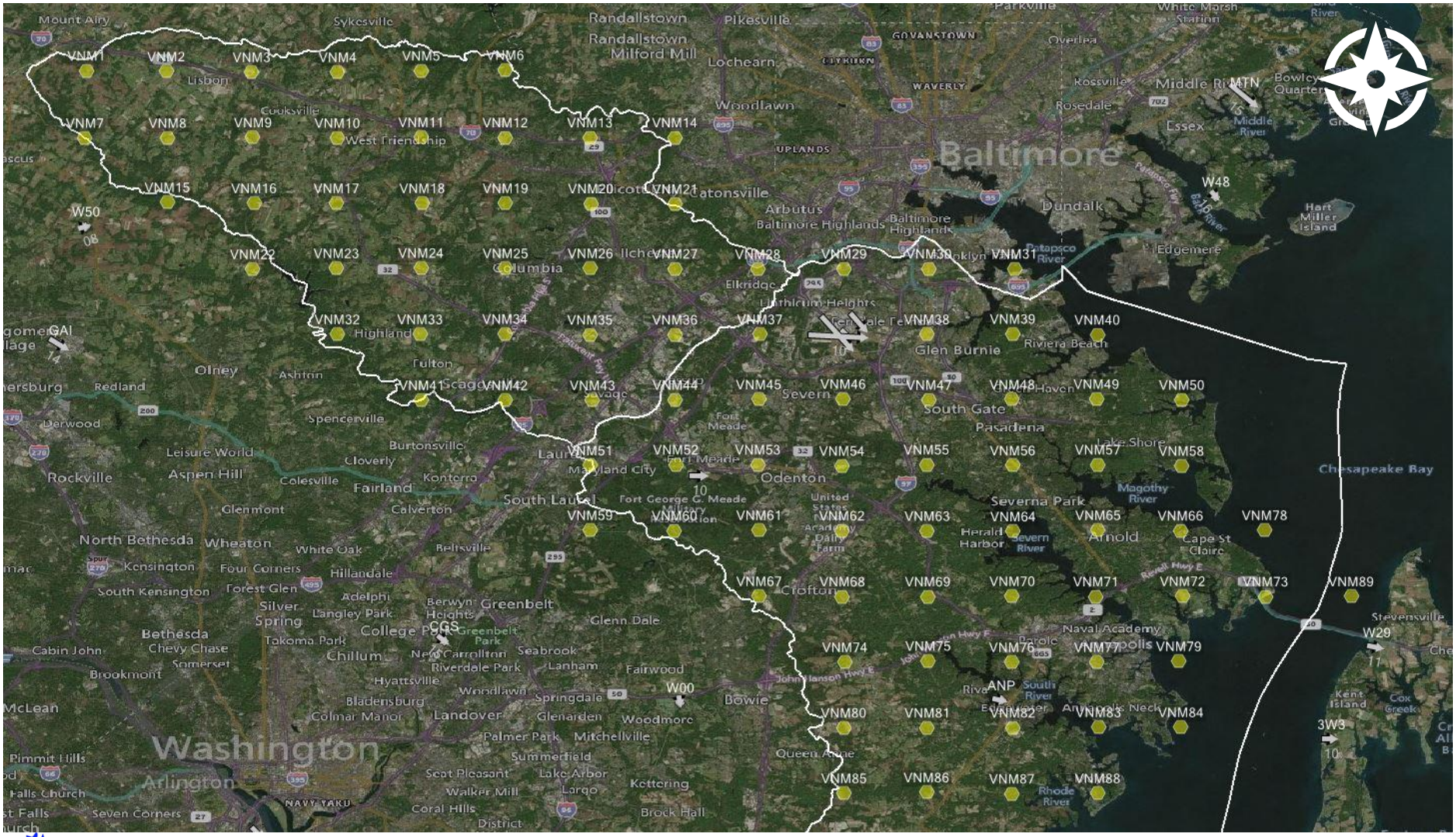
Howard County

Name	Latitude	Longitude	Elevation	Location
HOCO_VNM1	39.17369	-76.78301	270	Howard Square Apartments
HOCO_VNM2	39.234427	-76.891275	458	HCPSS Administration Campus
HOCO_VNM3	39.238088	-76.857598	448	Centennial Park
HOCO_VNM4	39.213634	-76.884347	327	HoCo General Hospital
HOCO_VNM5	39.211508	-76.862455	399	Merriweather Post Pavilion
HOCO_VNM6	39.208174	-76.837858	327	Oakland Mills HS
HOCO_VNM7	39.206077	-76.81119	327	Long Reach HS
HOCO_VNM8	39.194622	-76.755931	427	Troy Park
HOCO_VNM9	39.194418	-76.736216	139	Harwood Park N'hood
HOCO_VNM10	39.198125	-76.88285	218	Abiding Savior Lutheran
HOCO_VNM11	39.266476	-76.97678	448	Tridelphia Ridge ES
HOCO_VNM12	39.187977	-76.880921	596	Atholton HS
HOCO_VNM13	39.184075	-76.82624	369	Christ Church Episcopal
HOCO_VNM14	39.196329	-76.785616	427	Mayfield Woods MS
HOCO_VNM15	39.272817	-76.831701	309	Manor Woods ES
HOCO_VNM16	39.179411	-76.806934	320	Gateway Site
HOCO_VNM17	39.184212	-76.740088	327	Oxford Square Neighborhood
HOCO_VNM18	39.203936	-76.9432	218	St. Louis Catholic

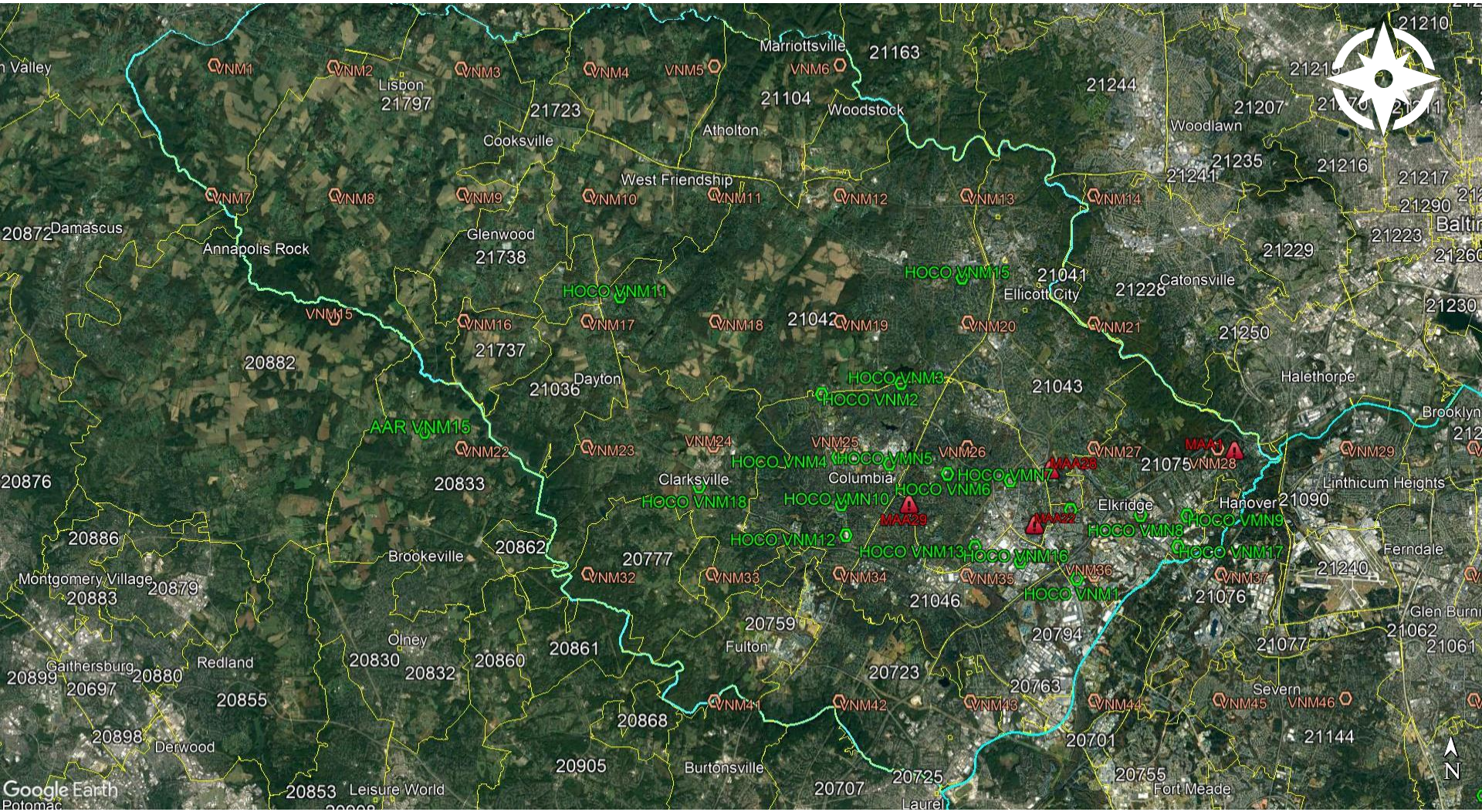
Anne Arundel County

Name	Latitude	Longitude	Elevation	Location
AAR_VNM1	38.8044	-76.518	145	RAVNN
AAR_VNM2	38.8877	-76.5116	32	JETNA
AAR_VNM3	39.0663	-76.5761	123	Arden on the Severn
AAR_VNM4	38.9413	-76.5399	36	London Public House
AAR_VNM5	38.9586	-76.5116	24	Annapolis Middle School
AAR_VNM6	38.9913	-76.5033	59	West Annapolis Elementary
AAR_VNM7	39.0538	-76.0688	23	Herald Harbor
AAR_VNM8	38.9638	-76.4938	57	Eastport Terrace
AAR_VNM9	38.9666	-76.5025	20	Truxton Park
AAR_VNM10	39.1019	-76.6108	121	Shipley's Choice Elementary
AAR_VNM11	38.9541	-76.5086	24	Robinwood
AAR_VNM12	38.9963	-76.493	20	Wardour Bluffs
AAR_VNM13	39.0552	-76.6388	118	Millersville Elementary School
AAR_VNM14	39.0294	-76.5399	123	Sherwood Forest
ARR_VNM15	39.2213	-77.0597	500	Brookeville, Montgomery County
AAR_VNM16	38.9969	-76.5591	87	Rolling Knolls
ARR_VNM17	38.9788	-76.4911	20	Maryland State House
ARR_VNM18	39.0441	-76.6155	161	I-97 and MD 178 Crownsville

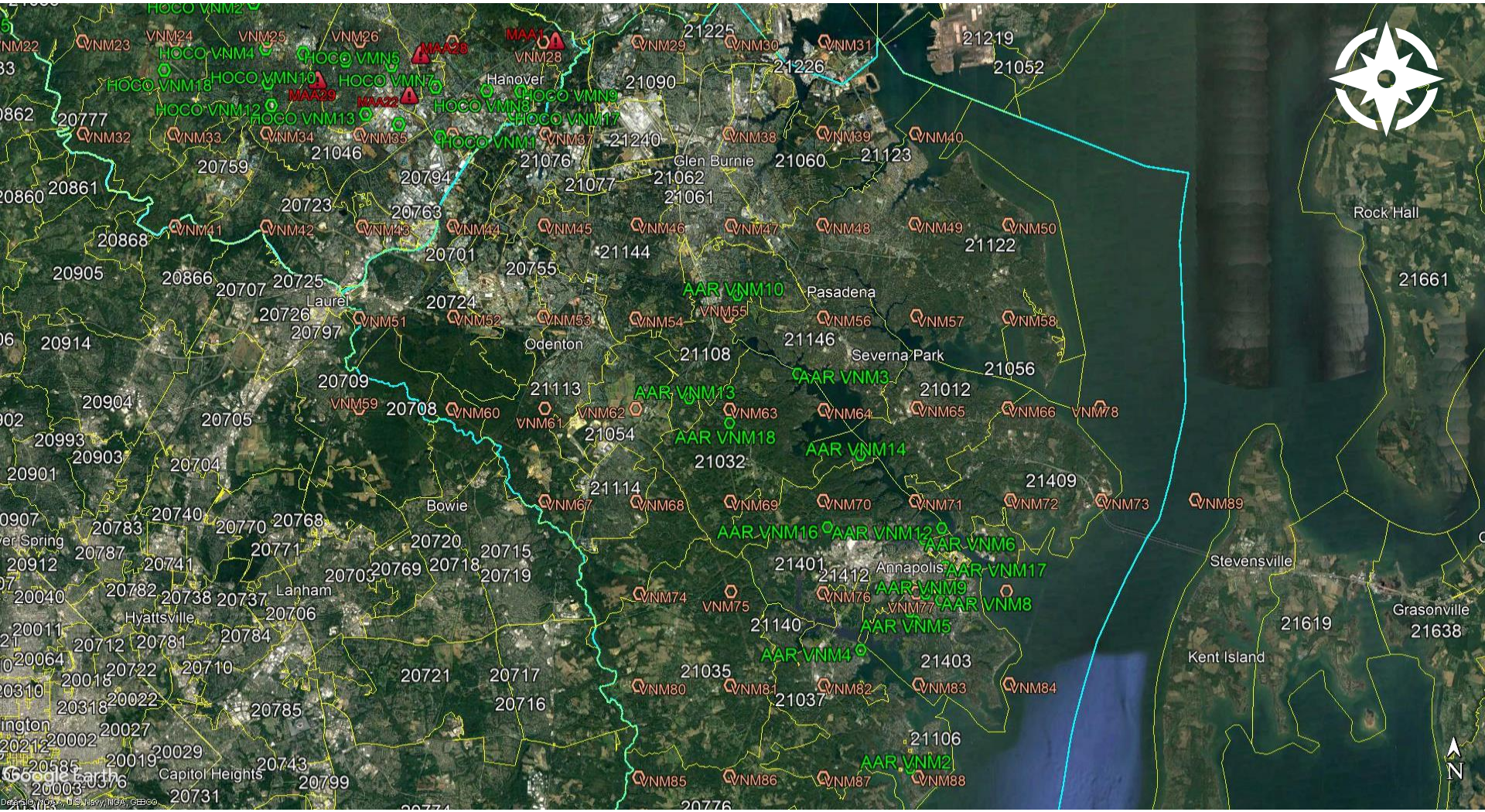
Noise Exposure – Virtual Noise Monitor Locations



Virtual Noise Monitor Locations – Howard County


VNM1
VNM2
VNM3
VNM4
VNM5
VNM6
VNM7
VNM8
VNM9
VNM10
VNM11
VNM12
VNM13
VNM14
VNM15
VNM16
VNM17
VNM18
VNM19
VNM20
VNM21
VNM22
VNM23
VNM24
VNM25
VNM26
VNM27
VNM28
VNM29
VNM32
VNM33
VNM34
VNM35
VNM36
VNM37
VNM41
VNM42
VNM43
VNM44
VNM45
VNM46
HOCO VNM1
HOCO VNM2
HOCO VNM3
HOCO VNM4
HOCO VNM5
HOCO VNM6
HOCO VNM7
HOCO VNM8
HOCO VNM9
HOCO VNM10
HOCO VNM11
HOCO VNM12
HOCO VNM13
HOCO VNM15
HOCO VNM16
HOCO VNM17
HOCO VNM18
AAR VNM15
MAA1
MAA22
MAA28
MAA29
Marriottsville
Lisbon
Woodstock
Atholton
Cooksville
West Friendship
Woodlawn
Damascus
Annapolis Rock
Glenwood
Ellicott City
Catonsville
Dayton
Halethorpe
Clarksville
Columbia
Elkridge
Hanover
Linthicum Heights
Brookeville
Montgomery Village
Olney
Fulton
Redland
Gaithersburg
Derwood
Burtonsville
Leisure World
Potomac
Ferndale
Glen Burnie
Severn
Fort Meade
Laurel
21163
21104
21244
21207
21797
21723
21235
21241
21216
21217
21290
21223
21229
21260
21230
21041
21228
21250
21738
21042
21737
21043
20882
21036
21075
21090
20876
20833
20886
20862
20777
20883
20879
20861
20860
20830
20832
20880
20899
20697
20855
20868
20905
20853
20707
20725
20723
20763
20701
21046
20759
20794
21076
21077
21062
21061
21240
21144
20872
21210
21215
21170
21211
21212
21231
21212
21226
21212
21212
21212

Virtual Noise Monitor Locations – Anne Arundel County



vianair

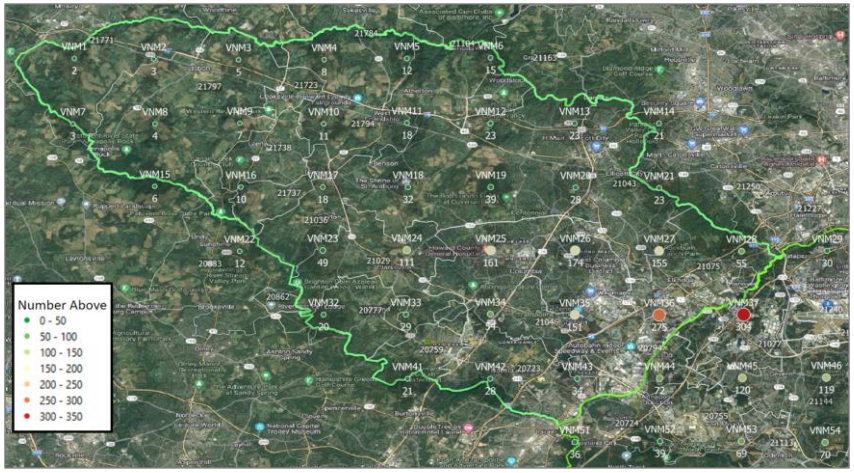
Noise Event Data
Number-of-Events-Above

The following slides include aircraft noise exposure levels at each of the 125 locations based on the Number-of-Events-Above metric (NA), and thresholds of 55 decibels, 65 decibels, and 75 decibels. The tables include both a total count for the reporting period (month) as well as the daily average for the month.

In addition to providing the data in tabular form, it is also provided in a map-based, graphical format.

Locations closest to the airport and/or concentrated flight corridors will typically see the highest noise exposure, in this case, highest DNL levels.

	Number-of-Events-Above 55 dBA		Number-of-Events-Above 65 dBA		Number-of-Events-Above 75 dBA	
Name	Total Events	Daily Average	Total Events	Daily Average	Total Events	Daily Average
VNM1	65	2	2	0	0	0
VNM2	82	3	4	0	1	0
VNM3	144	5	6	0	1	0
VNM4	259	8	9	0	2	0
VNM5	380	12	38	1	2	0
VNM6	460	15	122	4	8	0
VNM7	78	3	2	0	0	0
VNM8	135	4	4	0	1	0
VNM9	226	7	9	0	1	0
VNM10	349	11	29	1	3	0
VNM11	547	18	111	4	7	0
VNM12	699	23	174	6	18	1
VNM13	710	23	153	5	16	1
VNM14	666	21	114	4	21	1
VNM15	171	6	6	0	0	0
VNM16	297	10	24	1	2	0
VNM17	569	18	73	2	5	0
VNM18	985	32	195	6	13	0
VNM19	1,204	39	314	10	23	1
VNM20	859	28	303	10	26	1
VNM21	706	23	186	6	14	0
VNM22	377	12	31	1	1	0
VNM23	1,510	49	173	6	7	0
VNM24	3,433	111	442	14	43	1
VNM25	4,976	161	1,279	41	79	3



vianair

Noise Exposure: Number-of-Events-Above

(89 Monitor Points - Two-County, 2.5 mile grid)

	Number-of-Events-Above 55 dBA		Number-of-Events-Above 65 dBA		Number-of-Events-Above 75 dBA	
Name	Total Events	Daily Average	Total Events	Daily Average	Total Events	Daily Average
VNM1	167	5	0	0	0	0
VNM2	241	8	4	0	0	0
VNM3	343	11	5	0	0	0
VNM4	449	14	7	0	1	0
VNM5	503	16	4	0	1	0
VNM6	664	21	0	0	6	0
VNM7	218	7	4	0	0	0
VNM8	340	11	0	0	0	0
VNM9	419	14	0	0	0	0
VNM10	522	17	16	1	8	0
VNM11	703	23	15	0	15	0
VNM12	1006	32	18	1	24	1
VNM13	899	29	15	0	52	2
VNM14	894	29	36	1	37	1
VNM15	387	12	7	0	0	0
VNM16	478	15	12	0	10	0
VNM17	798	26	8	0	22	1
VNM18	1371	44	41	1	64	2
VNM19	1594	51	88	3	107	3
VNM20	978	32	81	3	137	4
VNM21	799	26	139	4	124	4
VNM22	552	18	23	1	15	0
VNM23	2601	84	60	2	44	1
VNM24	4429	143	251	8	125	4
VNM25	5802	187	555	18	214	7

vianair

Noise Exposure: Number-of-Events-Above

(89 Monitor Points - Two-County, 2.5 mile grid)

	Number-of-Events-Above 55 dBA		Number-of-Events-Above 65 dBA		Number-of-Events-Above 75 dBA	
Name	Total Events	Daily Average	Total Events	Daily Average	Total Events	Daily Average
VNM26	5821	188	489	16	227	7
VNM27	5141	166	281	9	204	7
VNM28	1470	47	224	7	175	6
VNM29	1128	36	249	8	109	4
VNM30	874	28	170	5	50	2
VNM31	713	23	275	9	28	1
VNM32	212	7	84	3	15	0
VNM33	447	14	180	6	41	1
VNM34	950	31	326	11	59	2
VNM35	1522	49	291	9	54	2
VNM36	2465	80	1431	46	93	3
VNM37	2593	84	2181	70	1782	57
VNM38	289	9	98	3	27	1
VNM39	179	6	64	2	20	1
VNM40	192	6	59	2	9	0
VNM41	313	10	153	5	26	1
VNM42	316	10	154	5	45	1
VNM43	252	8	155	5	56	2
VNM44	398	13	177	6	56	2
VNM45	1034	33	504	16	52	2
VNM46	1300	42	821	26	572	18
VNM47	1144	37	441	14	44	1
VNM48	296	10	114	4	35	1
VNM49	358	12	120	4	21	1
VNM50	249	8	56	2	11	0

Noise Exposure: Number-of-Events-Above

(89 Monitor Points - Two-County, 2.5 mile grid)

	Number-of-Events-Above 55 dBA		Number-of-Events-Above 65 dBA		Number-of-Events-Above 75 dBA	
Name	Total Events	Daily Average	Total Events	Daily Average	Total Events	Daily Average
VNM51	373	12	123	4	29	1
VNM52	215	7	114	4	26	1
VNM53	352	11	181	6	21	1
VNM54	391	13	97	3	32	1
VNM55	804	26	215	7	19	1
VNM56	608	20	159	5	28	1
VNM57	301	10	89	3	30	1
VNM58	218	7	65	2	15	0
VNM59	194	6	83	3	7	0
VNM60	690	22	140	5	2	0
VNM61	207	7	80	3	11	0
VNM62	267	9	87	3	26	1
VNM63	201	6	68	2	31	1
VNM64	688	22	129	4	37	1
VNM65	406	13	82	3	26	1
VNM66	191	6	53	2	12	0
VNM67	291	9	61	2	3	0
VNM68	594	19	73	2	11	0
VNM69	219	7	62	2	16	1
VNM70	327	11	78	3	21	1
VNM71	326	11	56	2	14	0
VNM72	221	7	37	1	5	0
VNM73	86	3	19	1	0	0
VNM74	217	7	35	1	3	0
VNM75	454	15	49	2	6	0

Noise Exposure: Number-of-Events-Above

(89 Monitor Points - Two-County, 2.5 mile grid)

	Number-of-Events-Above 55 dBA		Number-of-Events-Above 65 dBA		Number-of-Events-Above 75 dBA	
Name	Total Events	Daily Average	Total Events	Daily Average	Total Events	Daily Average
VNM76	317	10	46	1	6	0
VNM77	161	5	38	1	3	0
VNM78	123	4	29	1	0	0
VNM79	179	6	24	1	1	0
VNM80	120	4	18	1	0	0
VNM81	135	4	22	1	1	0
VNM82	116	4	22	1	0	0
VNM83	81	3	20	1	0	0
VNM84	69	2	16	1	0	0
VNM85	72	2	12	0	0	0
VNM86	76	2	14	0	0	0
VNM87	73	2	15	0	0	0
VNM88	63	2	12	0	0	0
VNM89	60	2	15	0	0	0

Noise Exposure: Number-of-Events-Above
(Anne Arundel County Landmark VNMs)

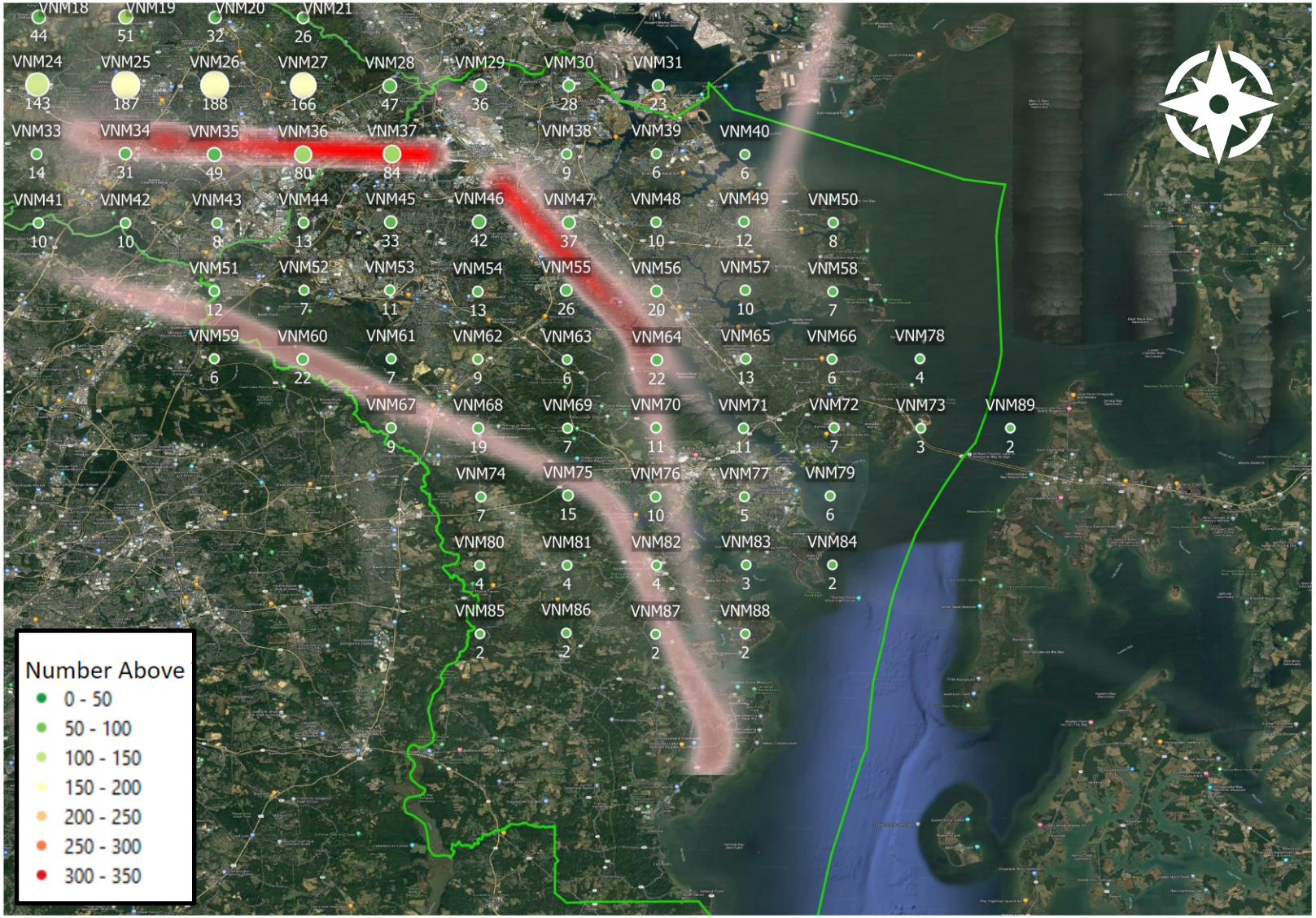
	Number-of-Events-Above 55 dBA		Number-of-Events-Above 65 dBA		Number-of-Events-Above 75 dBA	
Name	Total Events	Daily Average	Total Events	Daily Average	Total Events	Daily Average
AAR_VNM1	34	1	4	0	0	0
AAR_VNM2	66	2	14	0	0	0
AAR_VNM3	815	26	466	15	48	2
AAR_VNM4	213	7	30	1	1	0
AAR_VNM5	154	5	32	1	2	0
AAR_VNM6	264	9	54	2	10	0
AAR_VNM7	17	1	3	0	0	0
AAR_VNM8	137	4	33	1	1	0
AAR_VNM9	154	5	36	1	2	0
AAR_VNM10	1076	35	851	27	60	2
AAR_VNM11	137	4	29	1	1	0
AAR_VNM12	281	9	49	2	11	0
AAR_VNM13	237	8	72	2	36	1
AAR_VNM14	407	13	85	3	28	1
ARR_VNM15	477	15	144	5	12	0
AAR_VNM16	319	10	63	2	16	1
ARR_VNM17	244	8	37	1	6	0
ARR_VNM18	221	7	64	2	32	1

Noise Exposure: Number-of-Events-Above
(Howard County Landmark VNMs)

	Number-of-Events-Above 55 dBA		Number-of-Events-Above 65 dBA		Number-of-Events-Above 75 dBA	
Name	Total Events	Daily Average	Total Events	Daily Average	Total Events	Daily Average
HOCO_VNM1	2370	76	579	19	46	1
HOCO_VNM2	5027	162	651	21	153	5
HOCO_VNM3	4634	149	489	16	212	7
HOCO_VNM4	5836	188	1946	63	213	7
HOCO_VNM5	5935	191	2376	77	231	7
HOCO_VNM6	6076	196	2574	83	227	7
HOCO_VNM7	6083	196	3074	99	179	6
HOCO_VNM8	7079	228	4538	146	624	20
HOCO_VNM9	6956	224	2808	91	266	9
HOCO_VNM10	6902	223	1015	33	252	8
HOCO_VNM11	852	27	251	8	27	1
HOCO_VNM12	6672	215	2475	80	435	14
HOCO_VNM13	2091	67	1038	33	155	5
HOCO_VNM14	6190	200	3801	123	543	18
HOCO_VNM15	906	29	398	13	97	3
HOCO_VNM16	2103	68	1108	36	145	5
HOCO_VNM17	2572	83	1405	45	467	15
HOCO_VNM18	4007	129	671	22	144	5

Noise Exposure: Number-of-Events-Above 55 dBA *(Daily Average)*

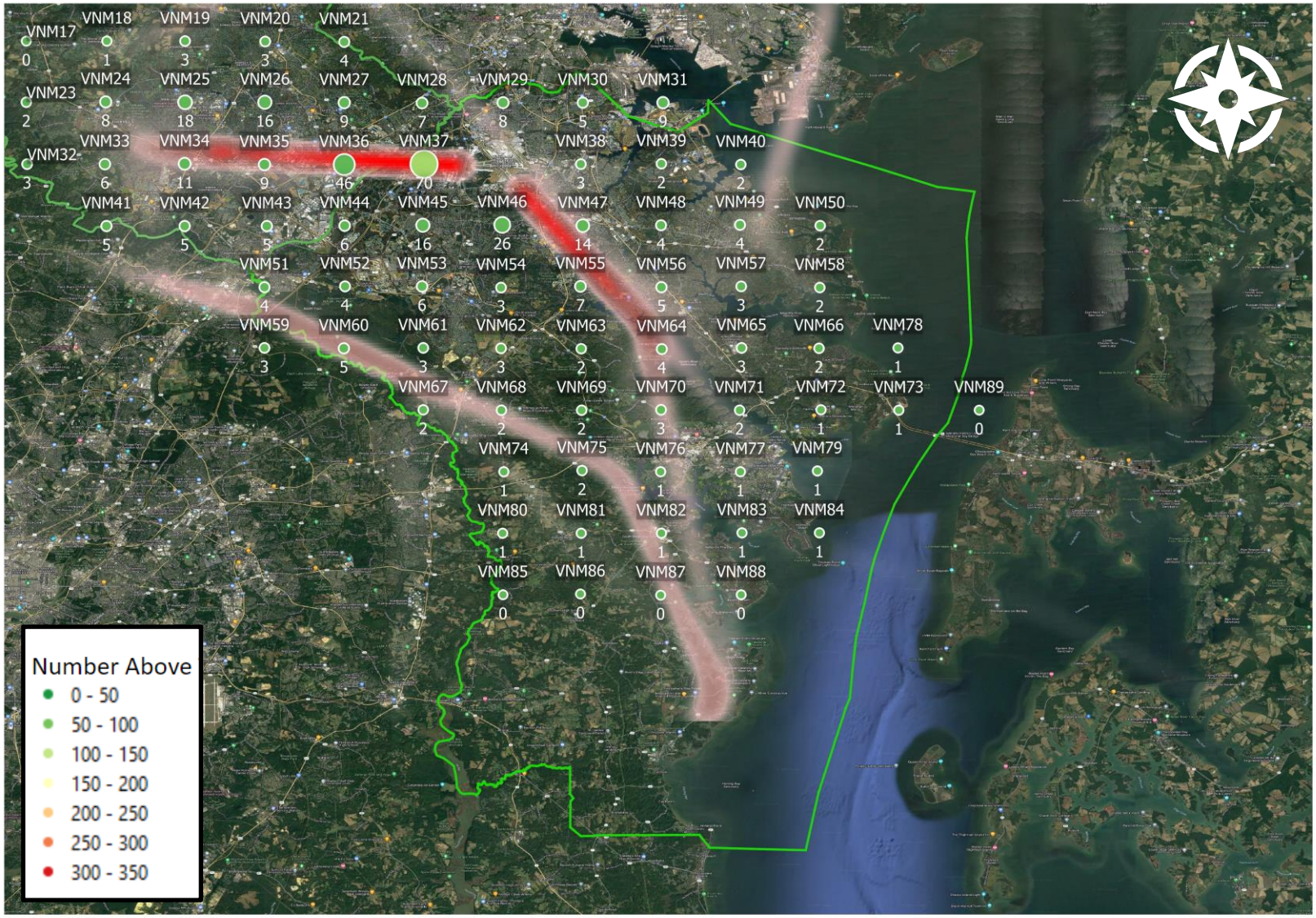
Anne Arundel County – Arrivals Heat Map



vianair

Noise Exposure: Number-of-Events-Above 65 dBA *(Daily Average)*

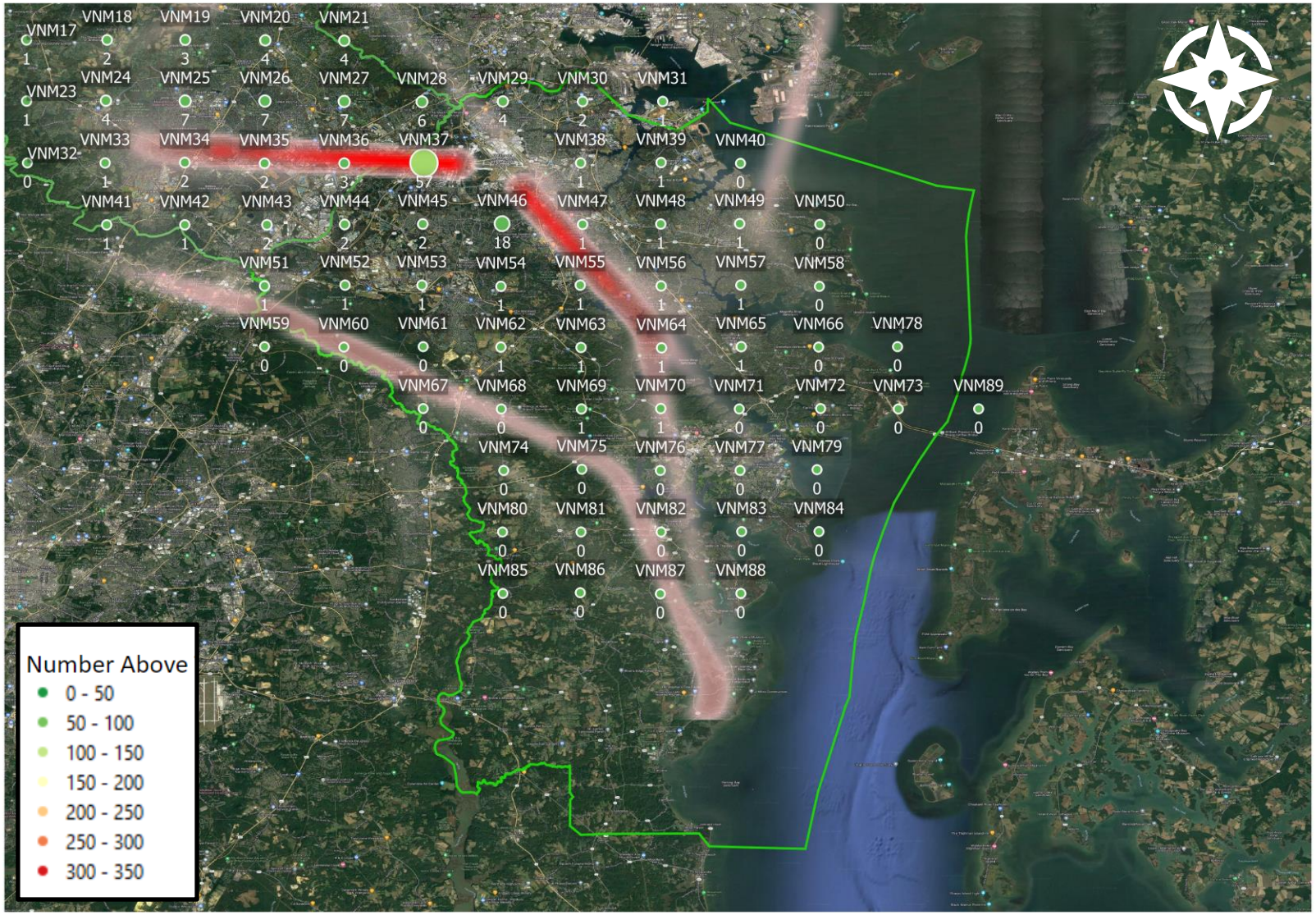
Anne Arundel County – Arrivals Heat Map



vianair

Noise Exposure: Number-of-Events-Above 75 dBA *(Daily Average)*

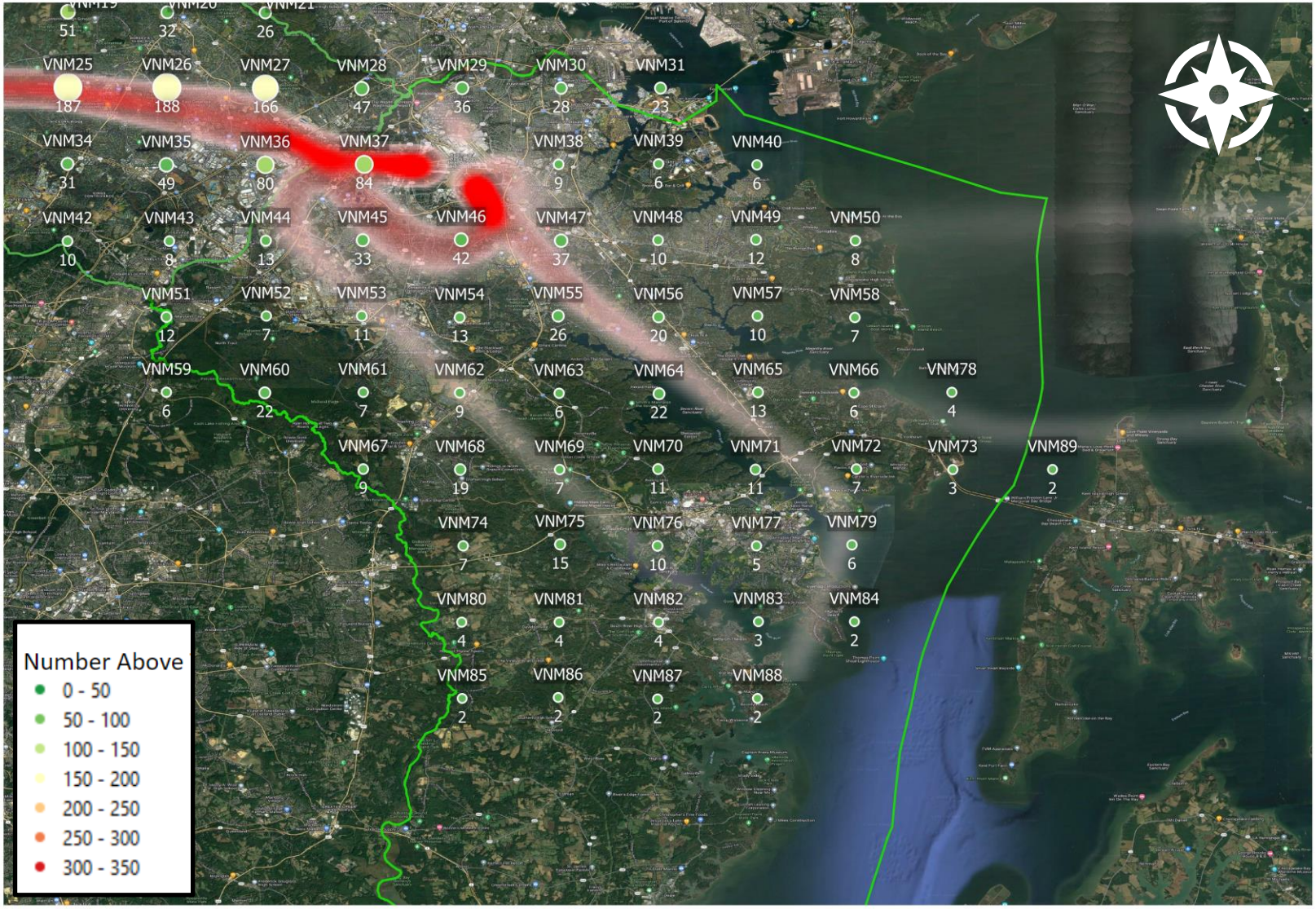
Anne Arundel County - Arrivals Heat Map



vianair

Noise Exposure: Number-of-Events-Above 55 dBA *(Daily Average)*

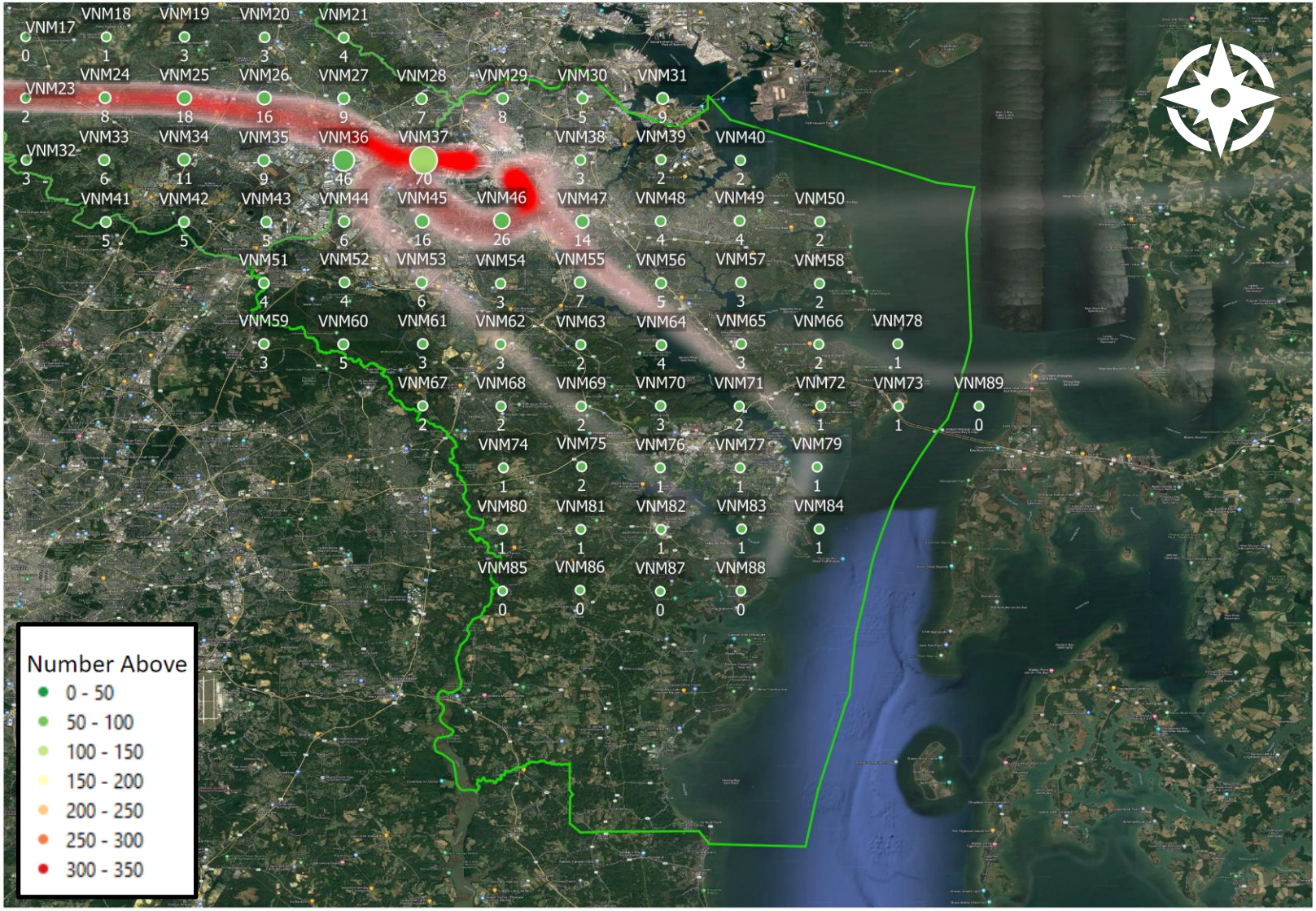
Anne Arundel County – Departures Heat Map



vianair

Noise Exposure: Number-of-Events-Above 65 dBA *(Daily Average)*

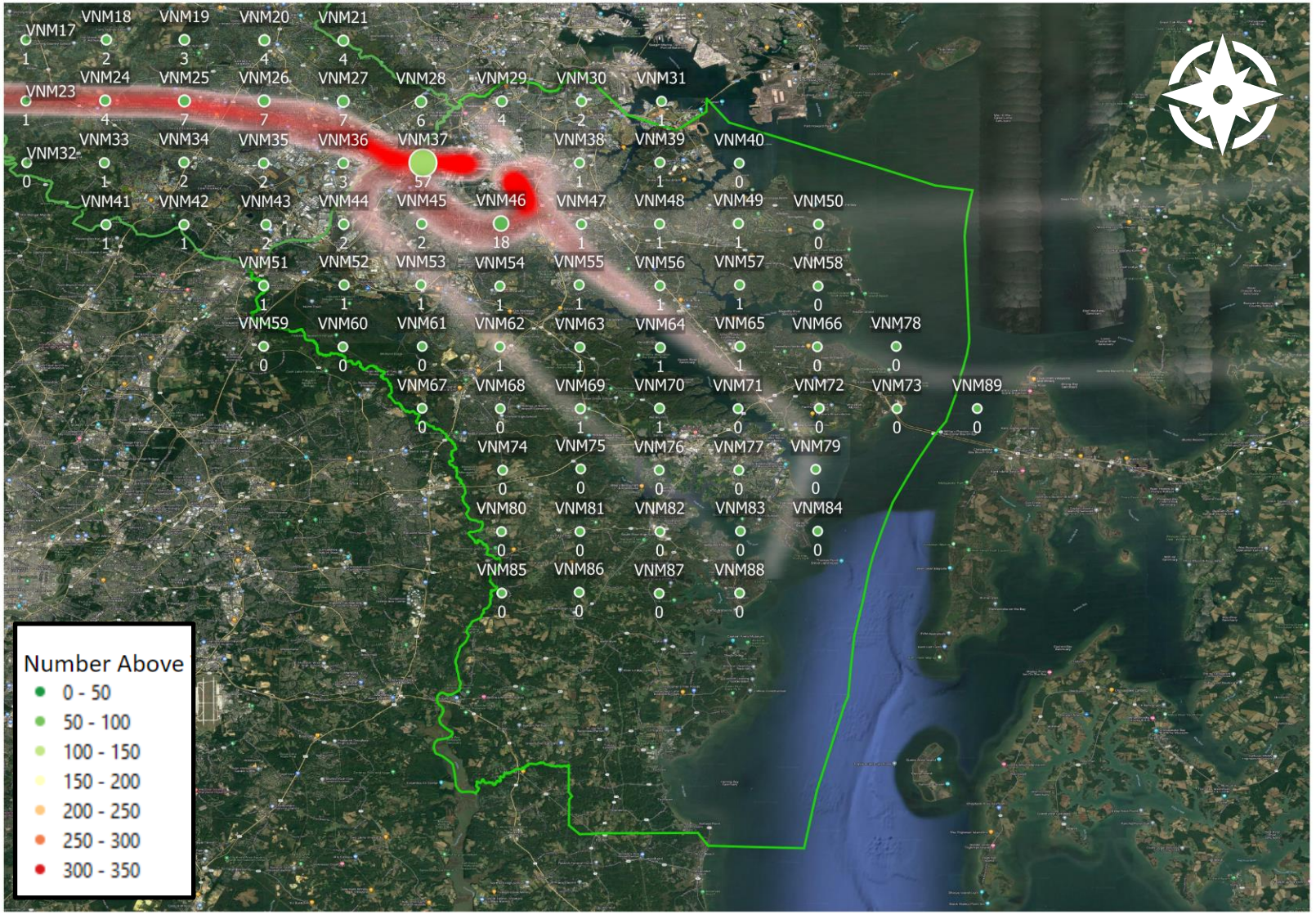
Anne Arundel County – Departures Heat Map



vianair

Noise Exposure: Number-of-Events-Above 75 dBA *(Daily Average)*

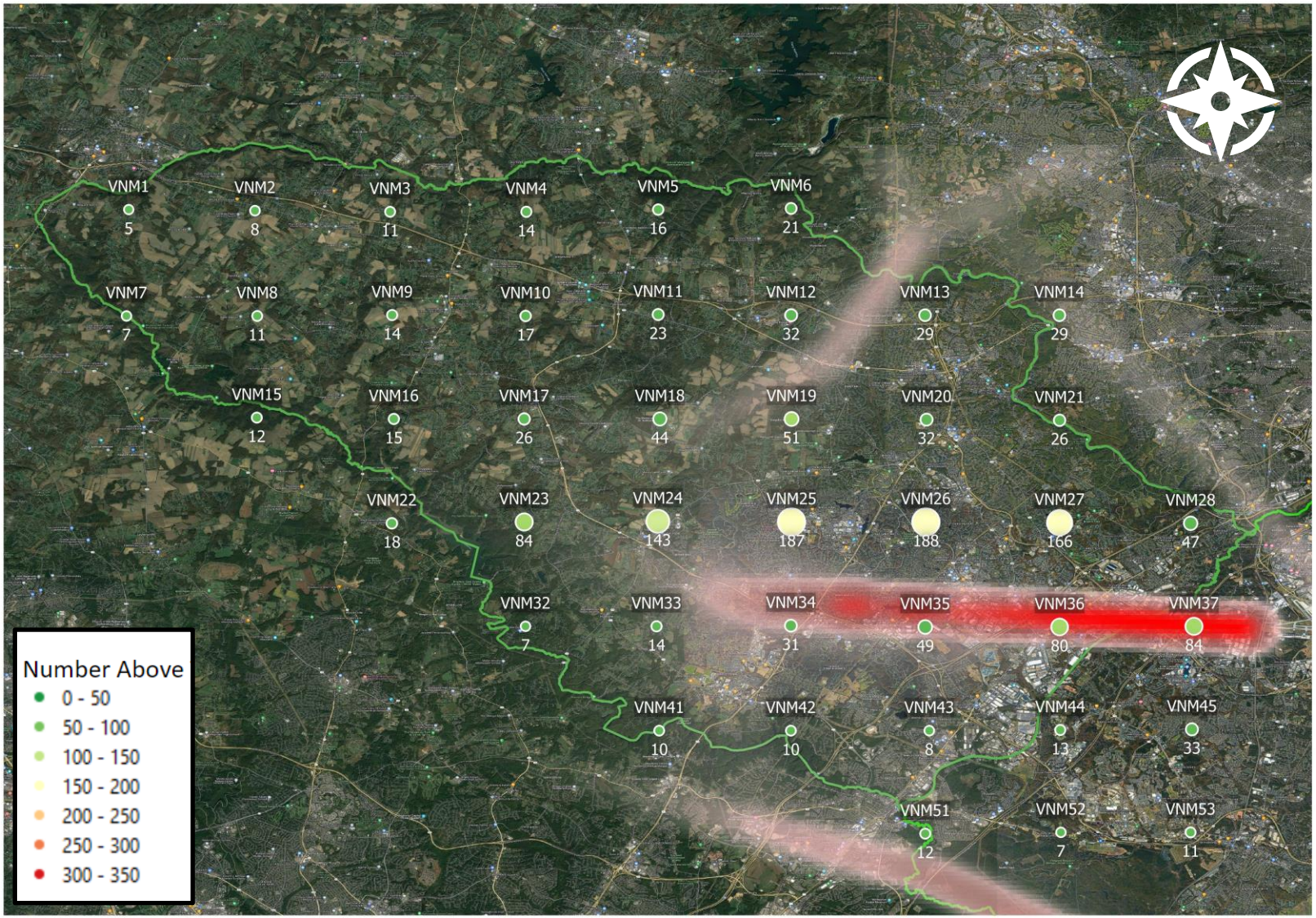
Anne Arundel County – Departures Heat Map



vianair

Noise Exposure: Number-of-Events-Above 55 dBA *(Daily Average)*

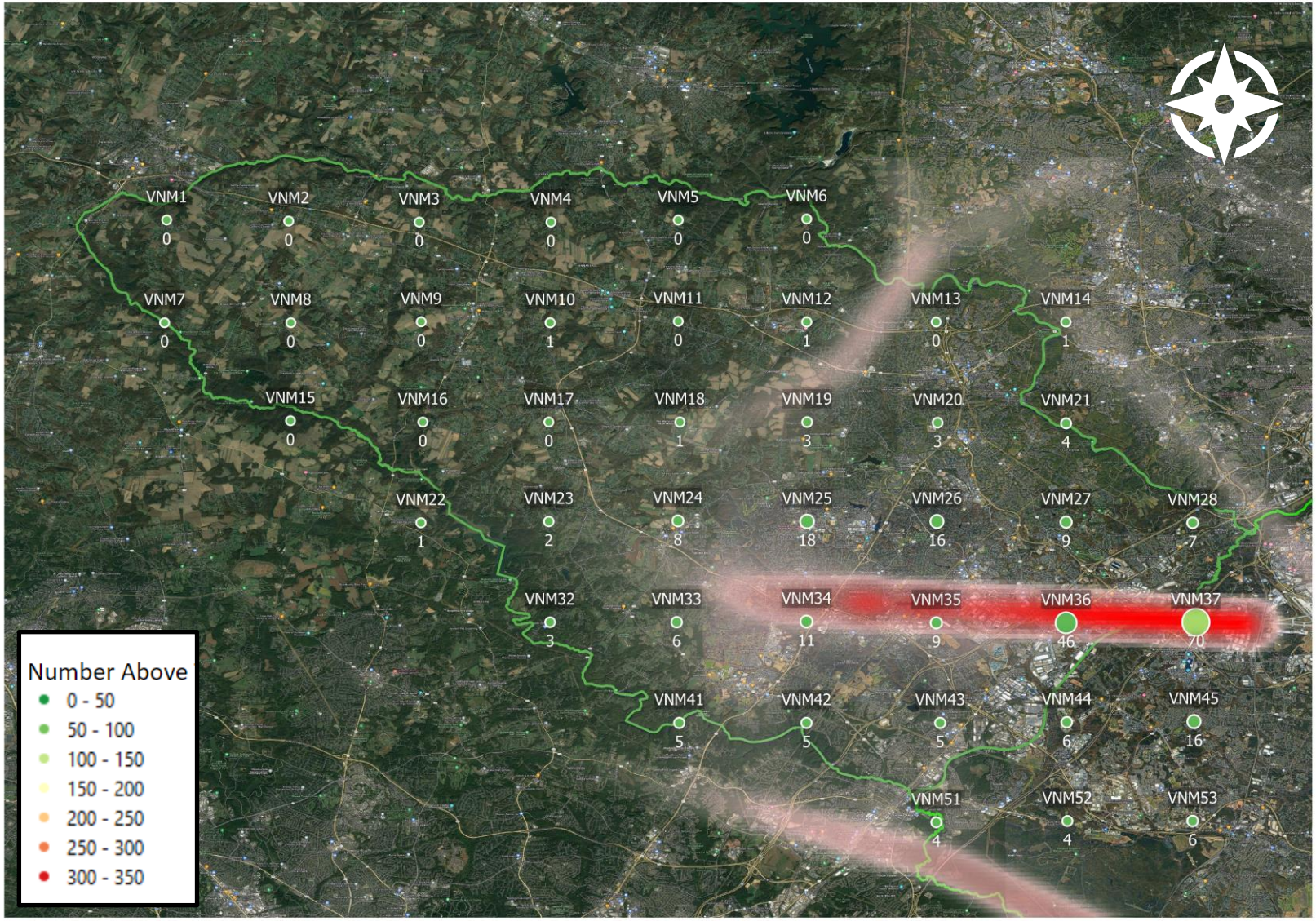
Howard County – Arrivals Heat Map



vianair

Noise Exposure: Number-of-Events-Above 65 dBA *(Daily Average)*

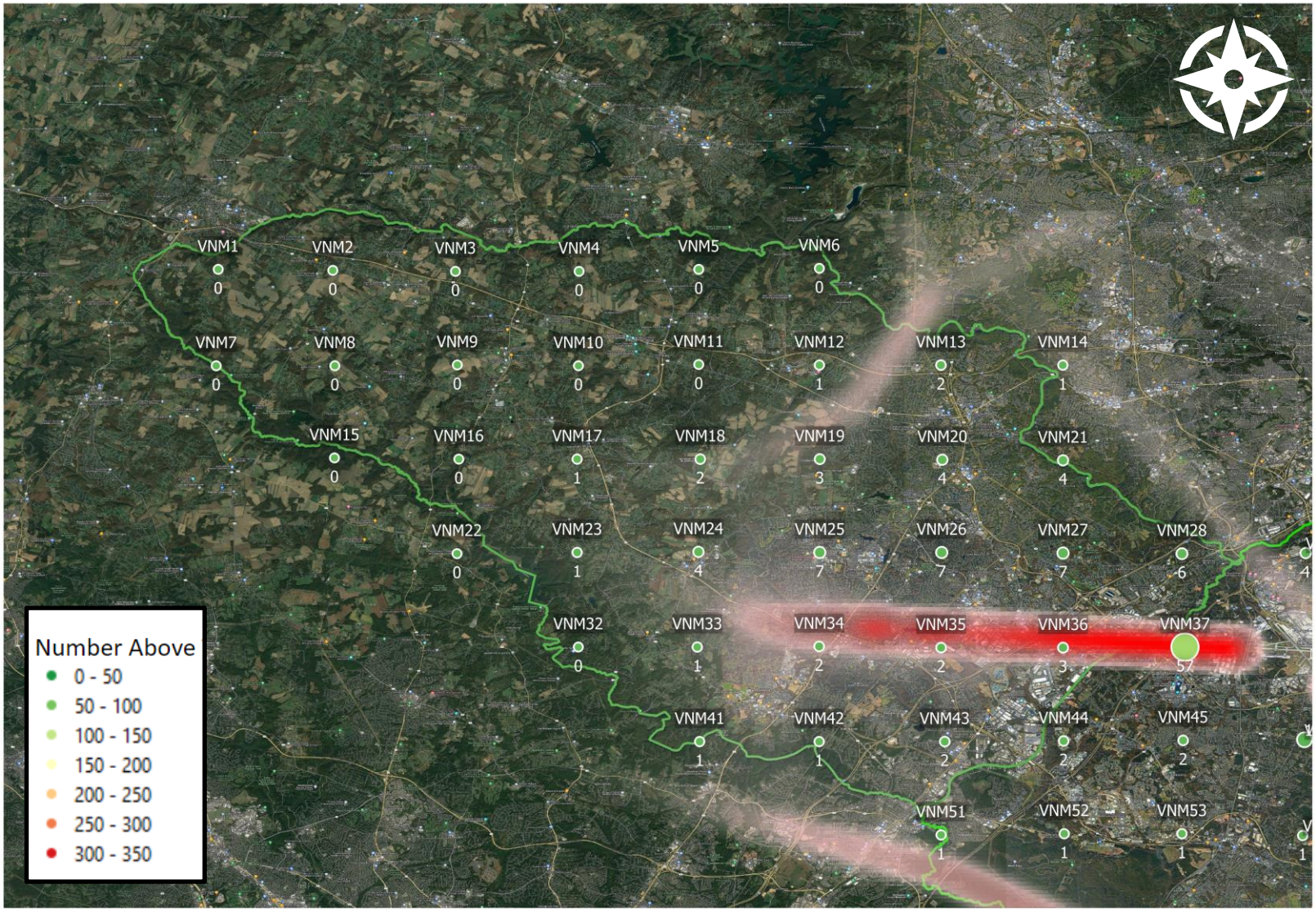
Howard County – Arrivals Heat Map



vianair

Noise Exposure: Number-of-Events-Above 75 dBA *(Daily Average)*

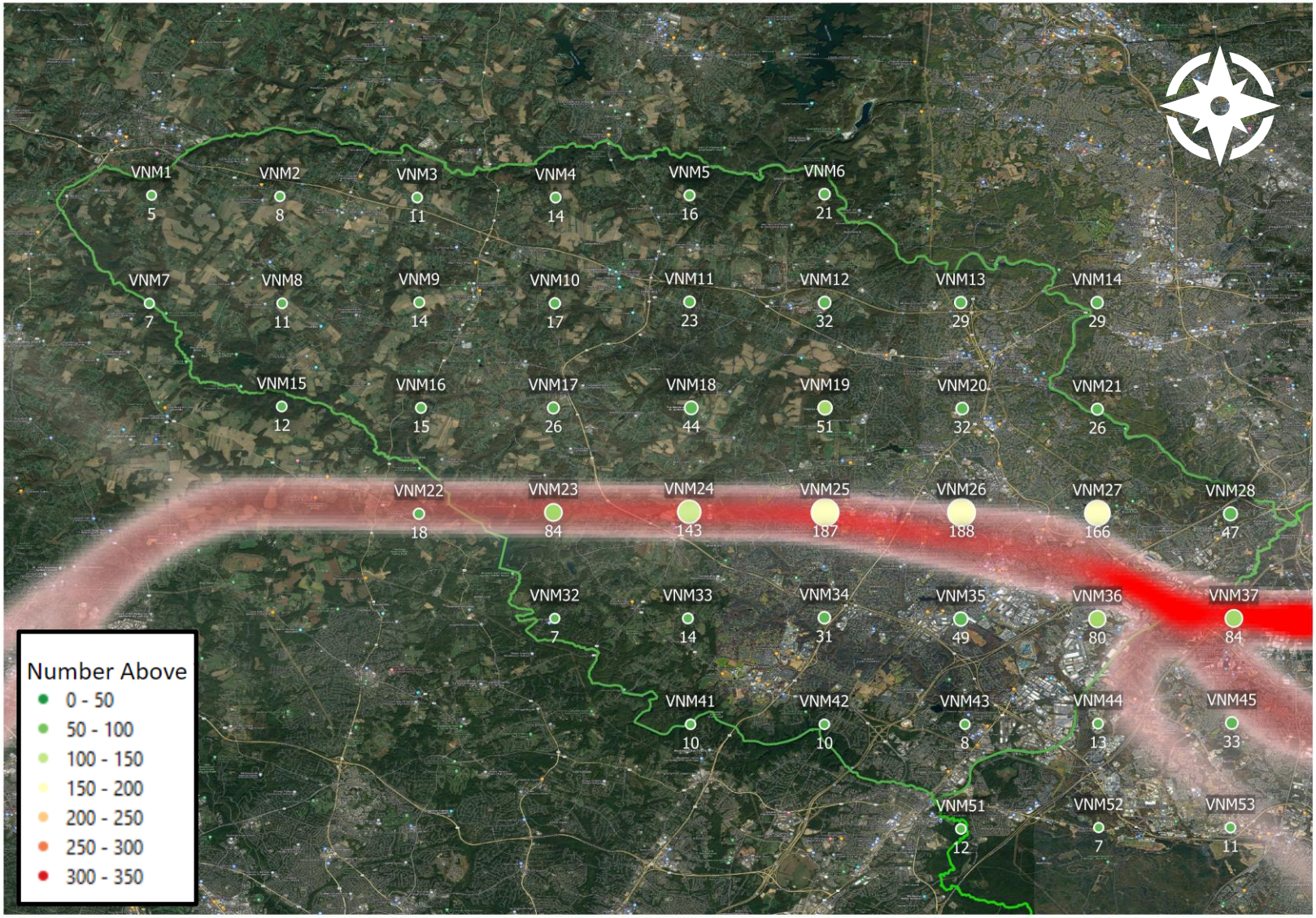
Howard County – Arrivals Heat Map



vianair

Noise Exposure: Number-of-Events-Above 55 dBA *(Daily Average)*

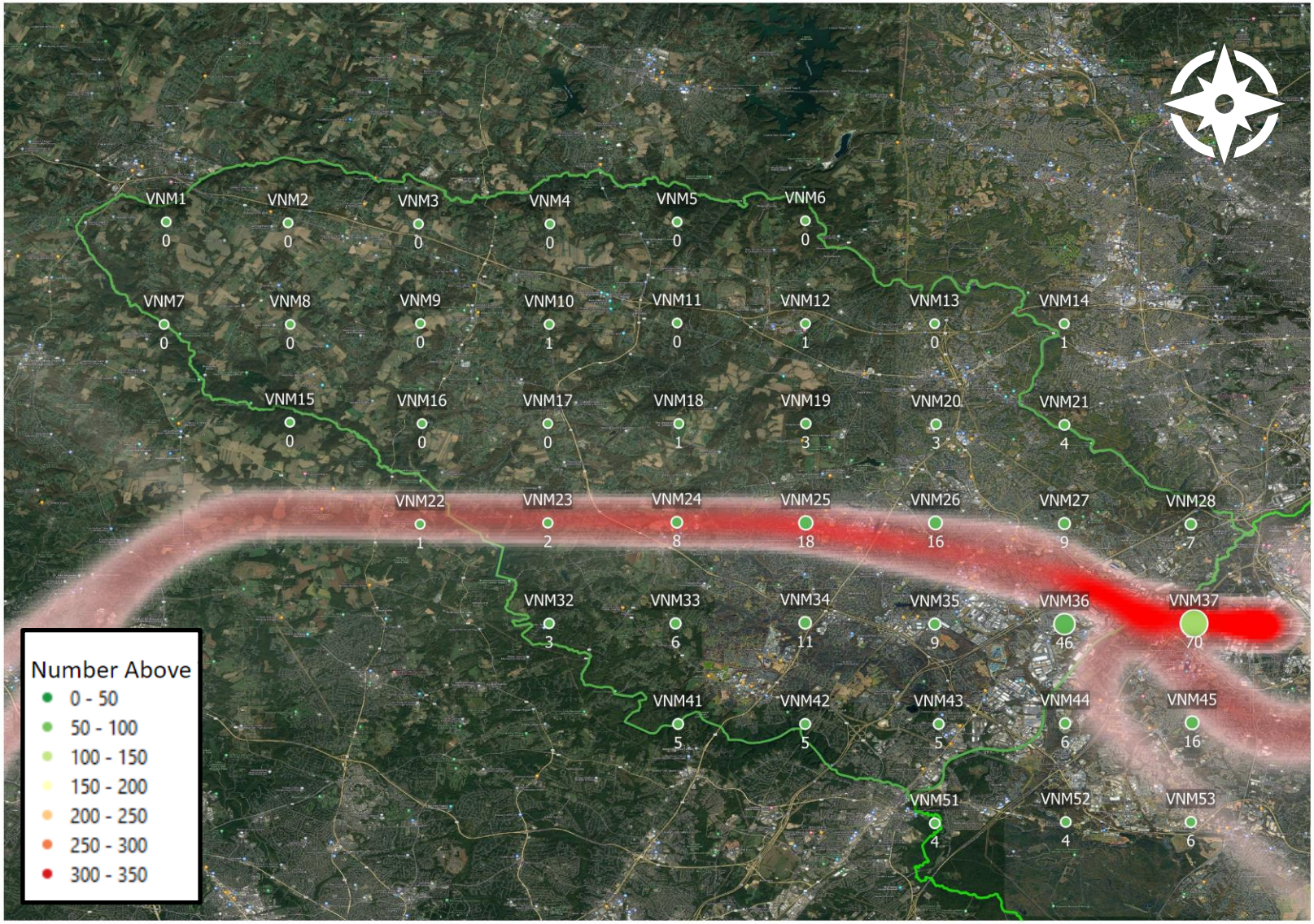
Howard County – Departures Heat Map



vianair

Noise Exposure: Number-of-Events-Above 65 dBA *(Daily Average)*

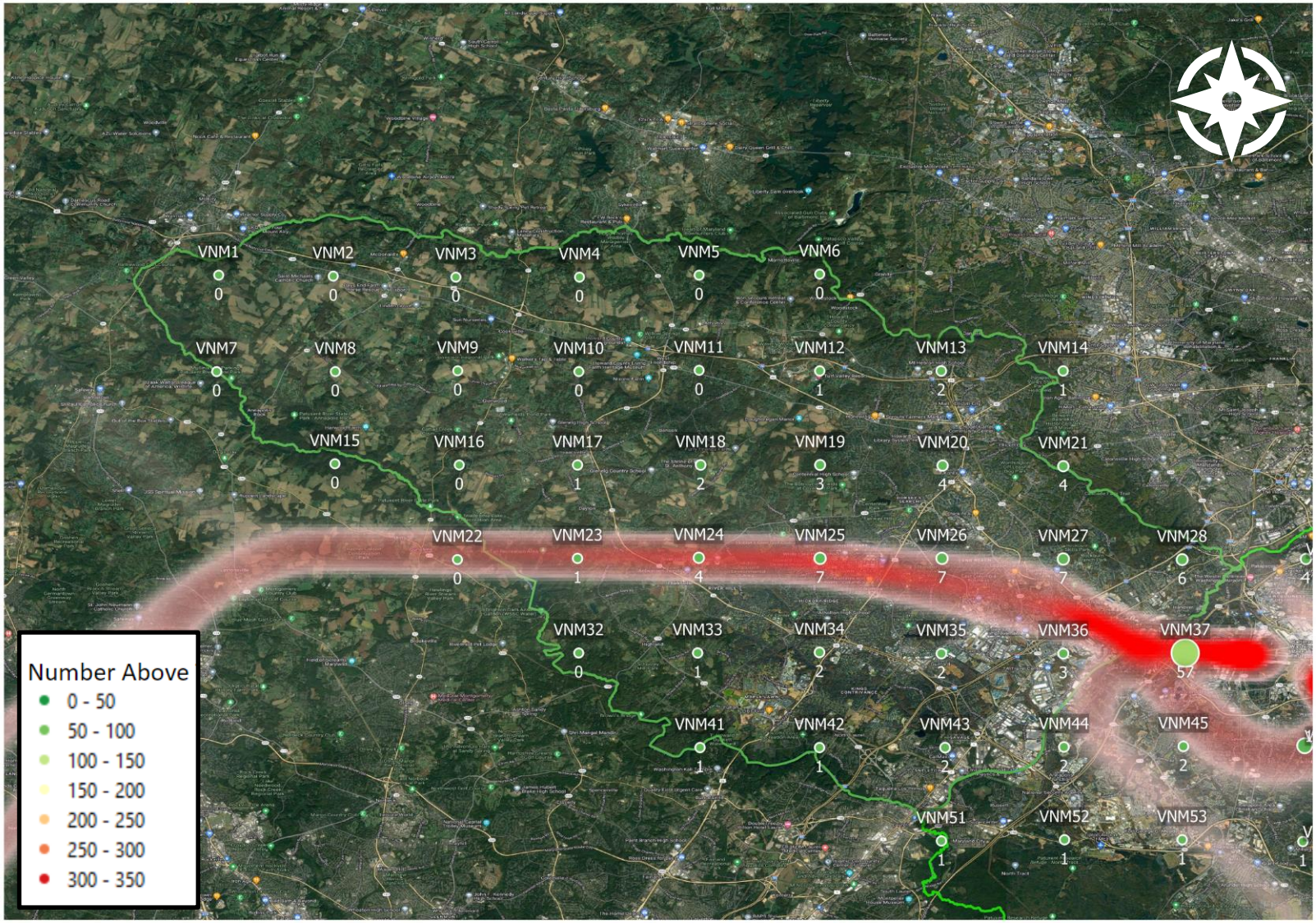
Howard County – Departures Heat Map



vianair

Noise Exposure: Number-of-Events-Above 75 dBA *(Daily Average)*

Howard County – Departures Heat Map



vianair

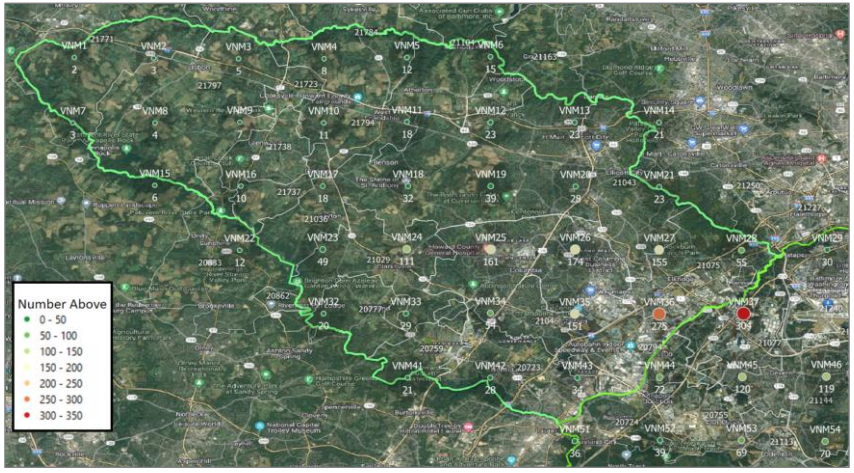
Noise Event Data
DNL

The following slides include aircraft noise exposure levels at each of the 125 locations based on the Day-Night Level (DNL) metric. The average daily DNL level for each location is included in the tables.

In addition to providing this data in tabular form, it is also provided in a map-based format. The maps include DNL values at the "Landmark" locations identified by the Roundtable and DNL contour maps which represent the noise exposure for the counties.

Locations closest to the airport and/or concentrated flight corridors will typically see the highest noise exposure, in this case, highest DNL levels while the contour maps provide DNL levels for the county.

	Number-of-Events-Above 55 dBA		Number-of-Events-Above 65 dBA		Number-of-Events-Above 75 dBA	
Name	Total Events	Daily Average	Total Events	Daily Average	Total Events	Daily Average
VNM1	65	2	2	0	0	0
VNM2	82	3	4	0	1	0
VNM3	144	5	6	0	1	0
VNM4	259	8	9	0	2	0
VNM5	380	12	38	1	2	0
VNM6	460	15	122	4	8	0
VNM7	78	3	2	0	0	0
VNM8	135	4	4	0	1	0
VNM9	226	7	9	0	1	0
VNM10	349	11	29	1	3	0
VNM11	547	18	111	4	7	0
VNM12	699	23	174	6	18	1
VNM13	710	23	153	5	16	1
VNM14	666	21	114	4	21	1
VNM15	171	6	6	0	0	0
VNM16	297	10	24	1	2	0
VNM17	569	18	73	2	5	0
VNM18	985	32	195	6	13	0
VNM19	1,204	39	314	10	23	1
VNM20	859	28	303	10	26	1
VNM21	706	23	186	6	14	0
VNM22	377	12	31	1	1	0
VNM23	1,510	49	173	6	7	0
VNM24	3,433	111	442	14	43	1
VNM25	4,976	161	1,279	41	79	3



vianair

Noise Exposure: DNL *(Daily Average)*

(89 Monitor Points - Two-County, 2.5 mile grid)

Name	DNL
VNM1	18.87
VNM2	21.33
VNM3	26.68
VNM4	31.22
VNM5	34.79
VNM6	40.52
VNM7	19.75
VNM8	23.37
VNM9	30.68
VNM10	35.6
VNM11	40.28
VNM12	45.93
VNM13	44.3
VNM14	45.91
VNM15	25.78
VNM16	33.68
VNM17	42.74
VNM18	48.37
VNM19	49.51
VNM20	47.28
VNM21	44.87
VNM22	35.68
VNM23	46.22
VNM24	53.11
VNM25	56.34

Name	DNL
VNM26	56.58
VNM27	53.86
VNM28	50.29
VNM29	48.69
VNM30	44.56
VNM31	39.97
VNM32	45.14
VNM33	54.01
VNM34	56.35
VNM35	59.65
VNM36	62.44
VNM37	73.14
VNM38	52.87
VNM39	45.31
VNM40	45.99
VNM41	47.86
VNM42	49.71
VNM43	52.17
VNM44	54.14
VNM45	56.82
VNM46	66.42
VNM47	58.24
VNM48	51.66
VNM49	51.06
VNM50	47.07

Name	DNL
VNM51	49.27
VNM52	45.92
VNM53	50.61
VNM54	49.74
VNM55	53.85
VNM56	54.71
VNM57	51.21
VNM58	46.83
VNM59	42.7
VNM60	53.48
VNM61	44.95
VNM62	47.88
VNM63	49.99
VNM64	54.74
VNM65	50.1
VNM66	45.43
VNM67	46.69
VNM68	49.46
VNM69	45.46
VNM70	49.47
VNM71	47.65
VNM72	43.62
VNM73	35.12
VNM74	43.72
VNM75	46.55

Name	DNL
VNM76	45.98
VNM77	41.38
VNM78	39.17
VNM79	36.19
VNM80	35.95
VNM81	37.29
VNM82	36.04
VNM83	30.39
VNM84	28.46
VNM85	28.2
VNM86	27.78
VNM87	27.7
VNM88	27.22
VNM89	27.75

Noise Exposure: DNL *(Daily Average)*

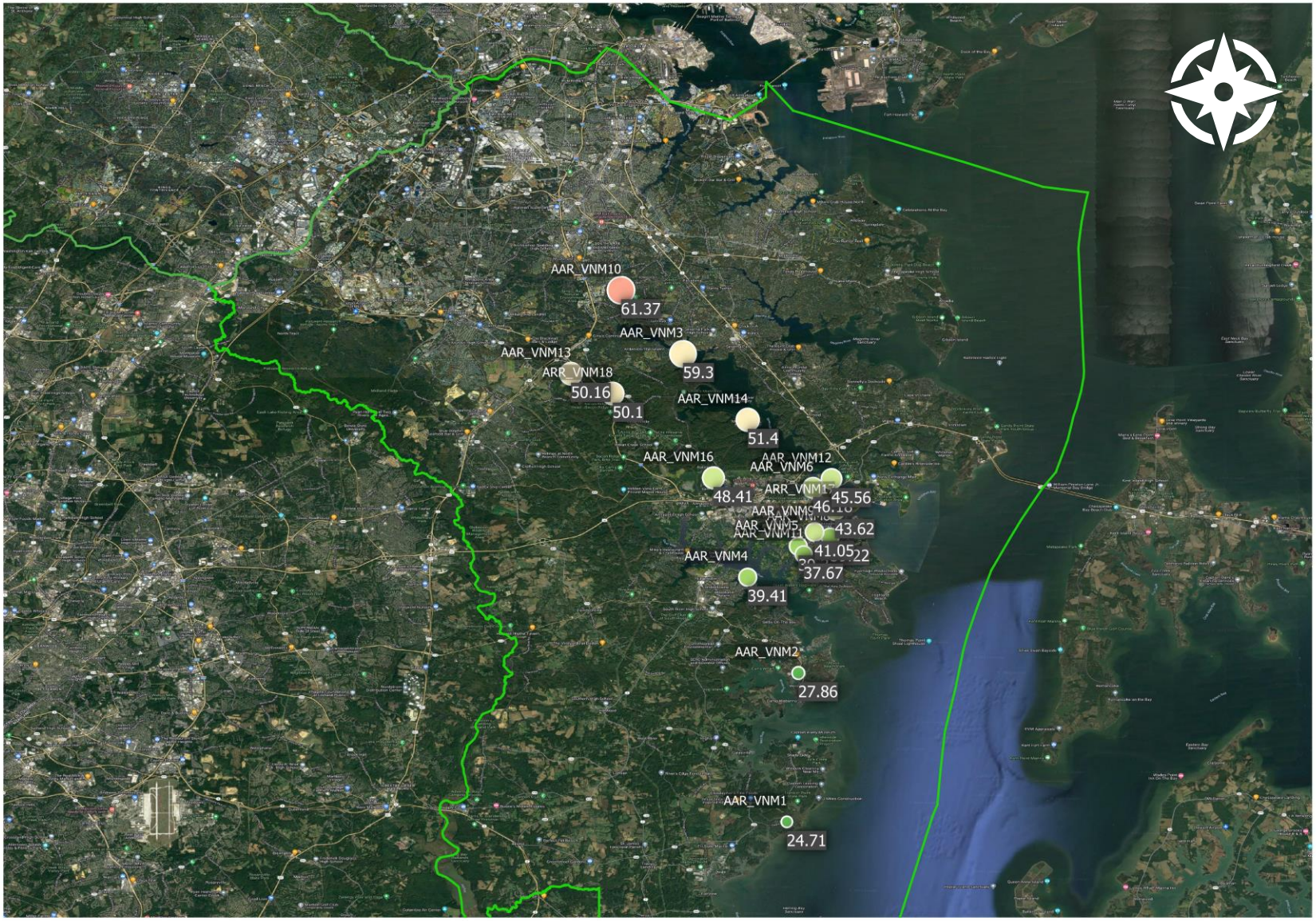
Landmark VNMs

Name	DNL
AAR_VNM1	24.71
AAR_VNM2	27.86
AAR_VNM3	59.3
AAR_VNM4	39.41
AAR_VNM5	39.31
AAR_VNM6	46.18
AAR_VNM7	19.76
AAR_VNM8	39.22
AAR_VNM9	41.05
AAR_VNM10	61.37
AAR_VNM11	37.67
AAR_VNM12	45.56
AAR_VNM13	50.16
AAR_VNM14	51.4
ARR_VNM15	33.59
AAR_VNM16	48.41
ARR_VNM17	43.62
ARR_VNM18	50.1

Name	DNL
HOCO_VNM1	61.24
HOCO_VNM2	53.01
HOCO_VNM3	51.69
HOCO_VNM4	56.3
HOCO_VNM5	57.42
HOCO_VNM6	58.23
HOCO_VNM7	58.85
HOCO_VNM8	61.17
HOCO_VNM9	59.36
HOCO_VNM10	56.59
HOCO_VNM11	42.74
HOCO_VNM12	60.92
HOCO_VNM13	64.54
HOCO_VNM14	61.23
HOCO_VNM15	45.39
HOCO_VNM16	70.16
HOCO_VNM17	67.42
HOCO_VNM18	55.56

Noise Exposure: DNL (Daily Average)

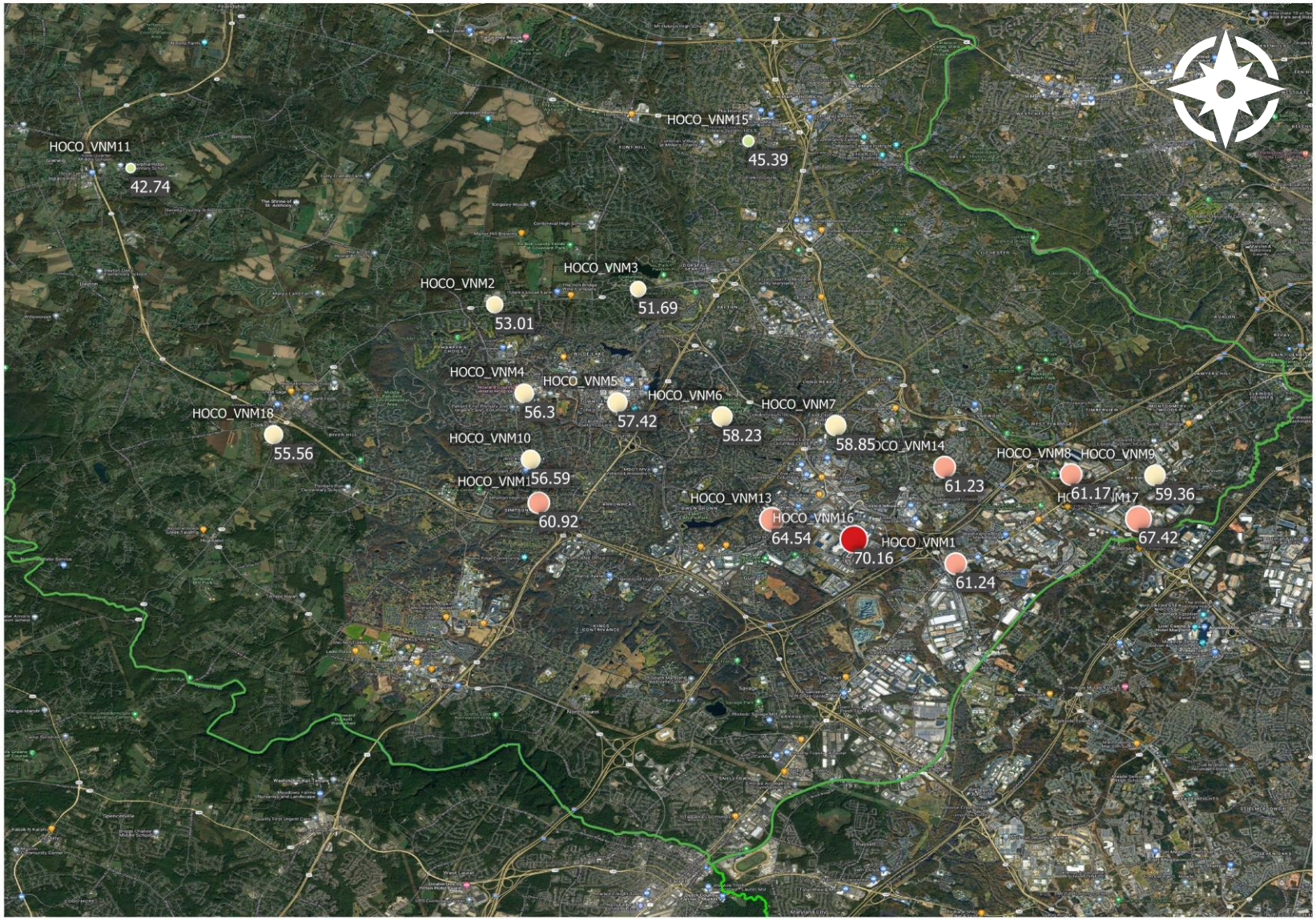
Anne Arundel County – Landmark Locations



vianair

Noise Exposure: DNL (Daily Average)

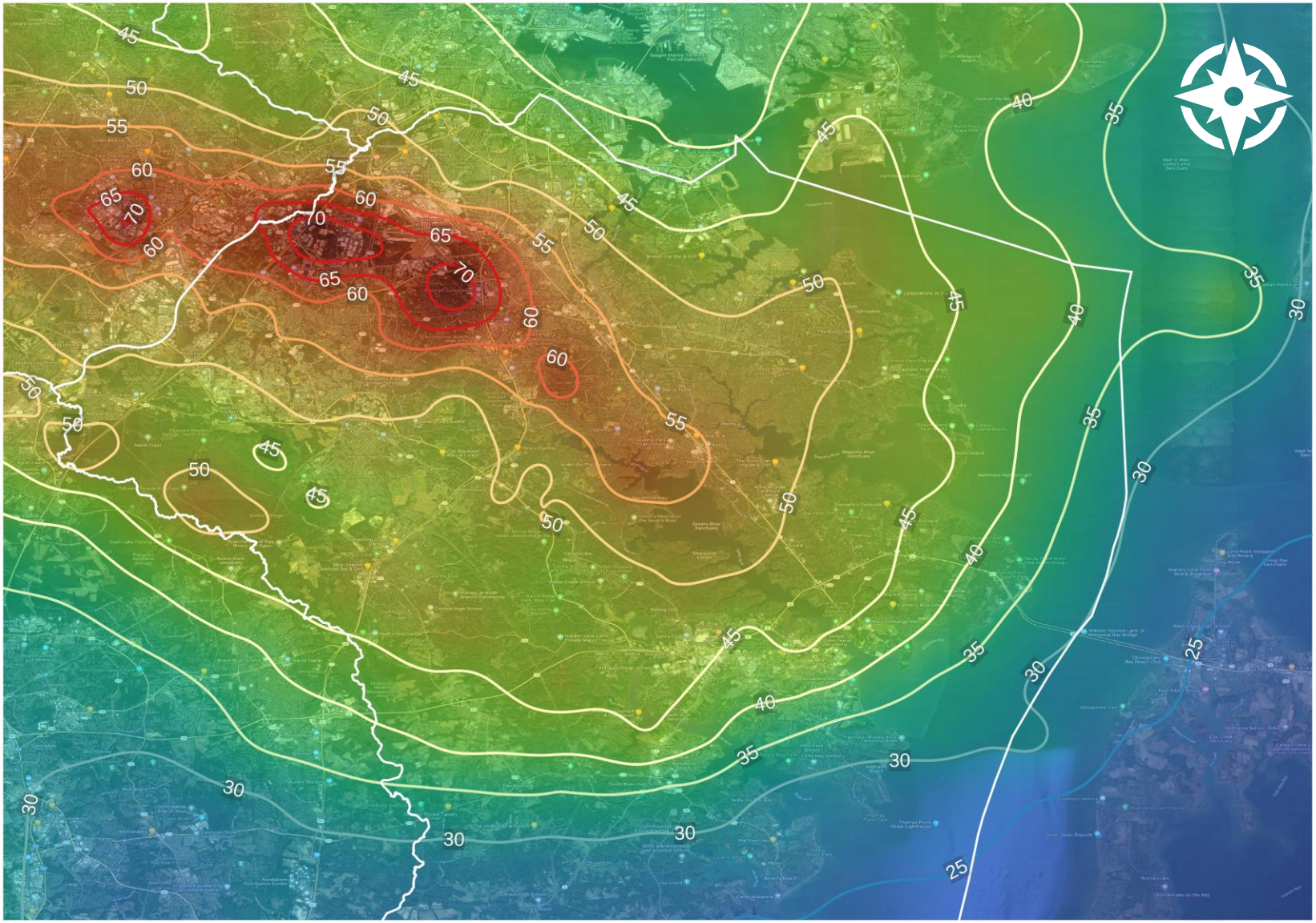
Howard County – Landmark Locations



vianair

Noise Exposure: DNL Contours (Daily Average)

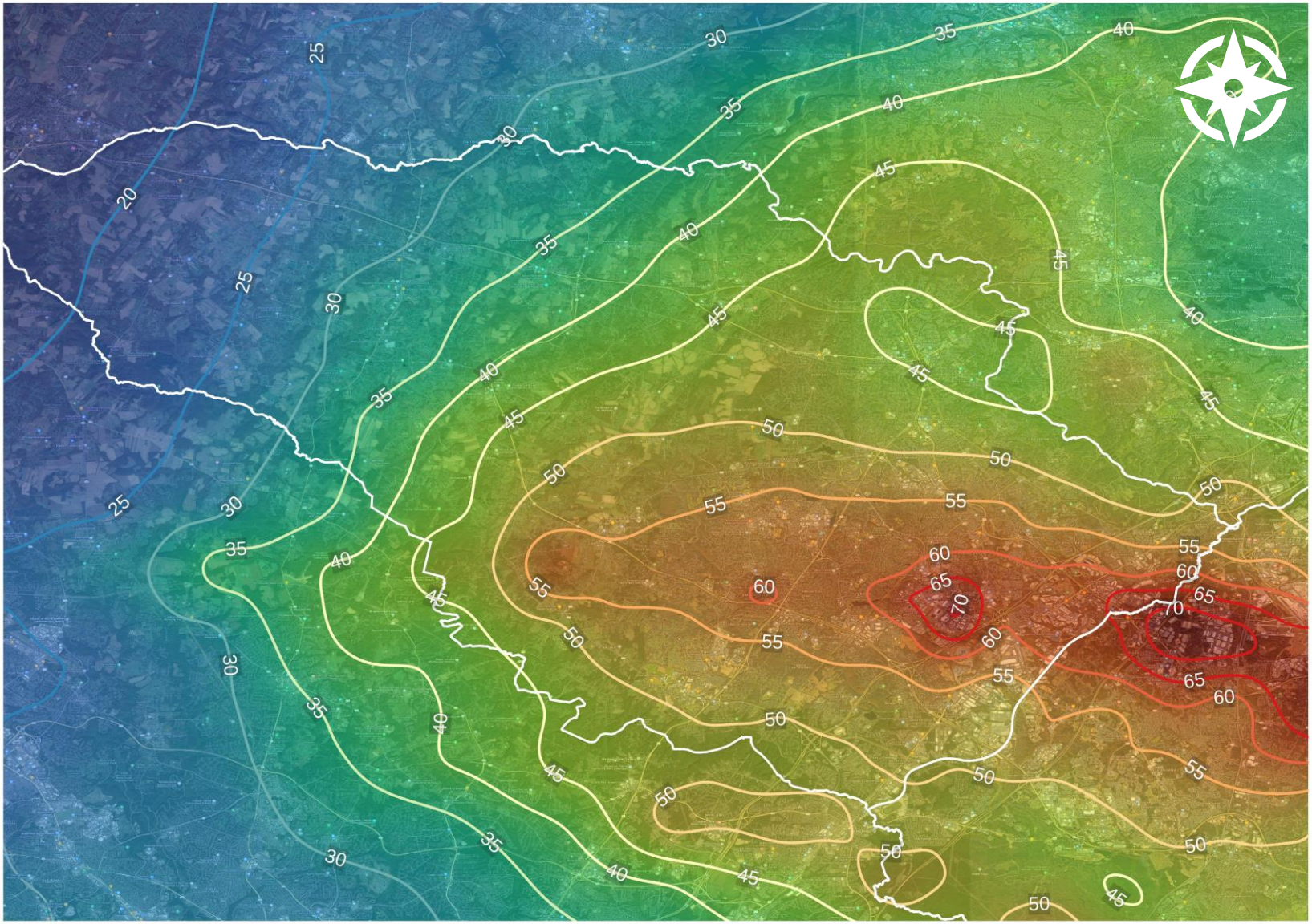
Anne Arundel County



vianair

Noise Exposure: DNL Contours (Daily Average)

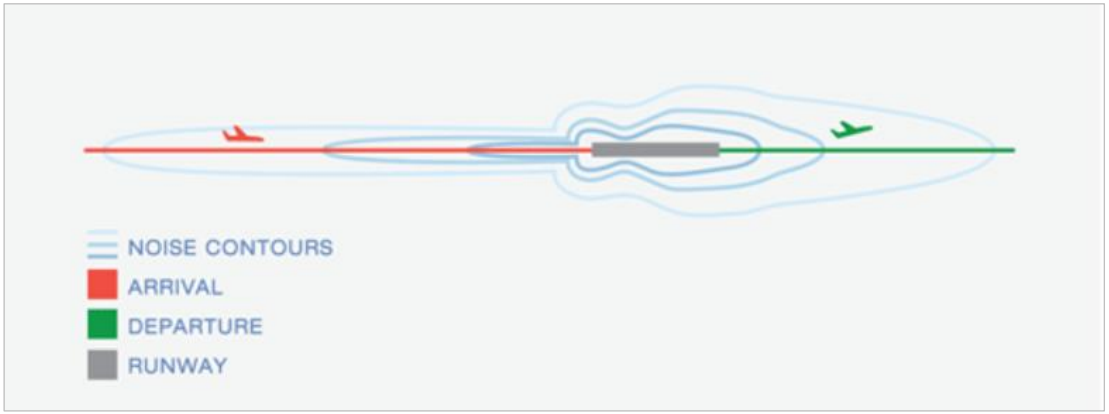
Howard County



vianair

Noise Exposure – Single Event Noise Contours

There was interest in understanding the noise exposure associated with single flights as opposed to the daily/monthly data provided in the original report. Single event contours can be produced, which illustrate the noise exposure associated with an aircraft landing or taking off. The graphic below is an example of noise exposure (shown in contours) of an aircraft arrival (red) and departure (green).

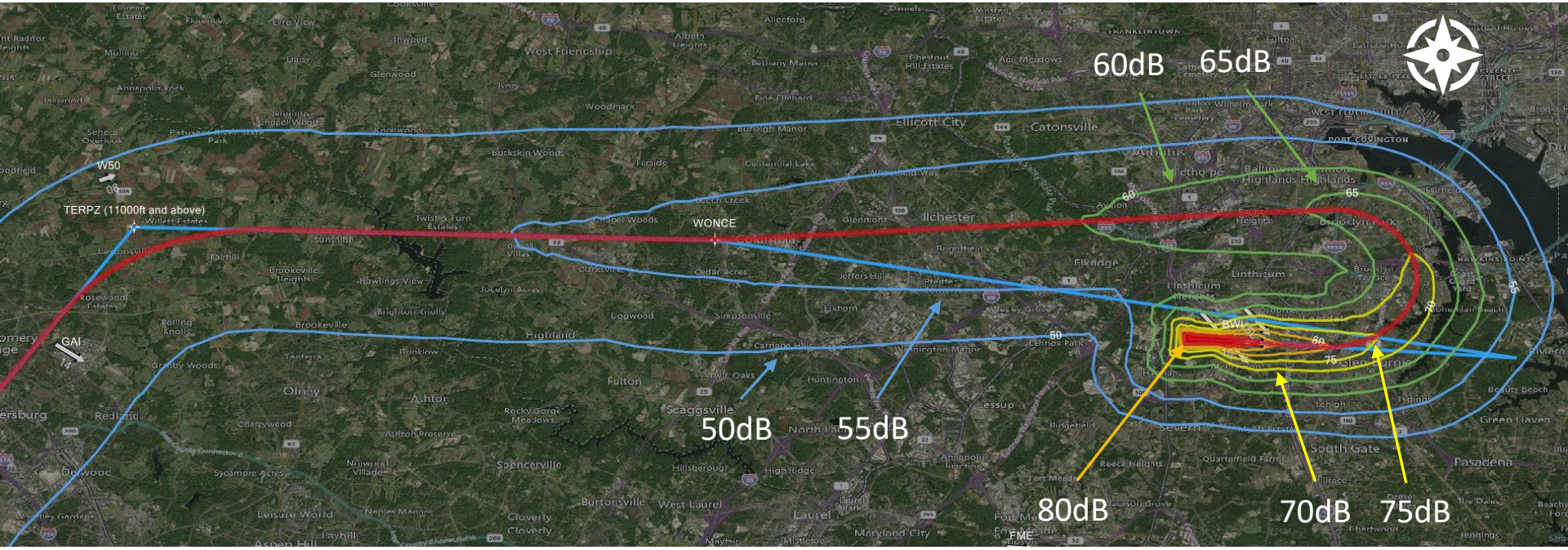


Source: Federal Aviation Administration (https://www.faa.gov/regulations_policies/policy_guidance/noise/basics)

The most common aircraft (based on total operations) at BWI is the Boeing 737-700. Vianair calculated the noise exposure for a single departure from both Runway 10 and Runway 28, illustrating the typical noise exposure experienced for communities below. This is shown on the next two slides.

Single Event Noise Contours

L_{max} 737-700 Departure RWY 10



Aircraft Type: B737-700
Stage Length: 3
Standard Profile

Noise contours based on A-weighted decibels (dBA)

vianair

Single Event Noise Contours

L_{max} 737-700 Departure RWY 28

Aircraft Type: B737-700
Stage Length: 3
Standard Profile

Noise contours based on A-weighted decibels (dBA)

vianair

For More Information…

If you have questions about this report, please contact Howard County at:

transportation@howardcountymd.gov

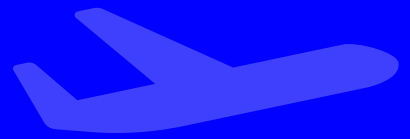
vianair

airspace design made easy

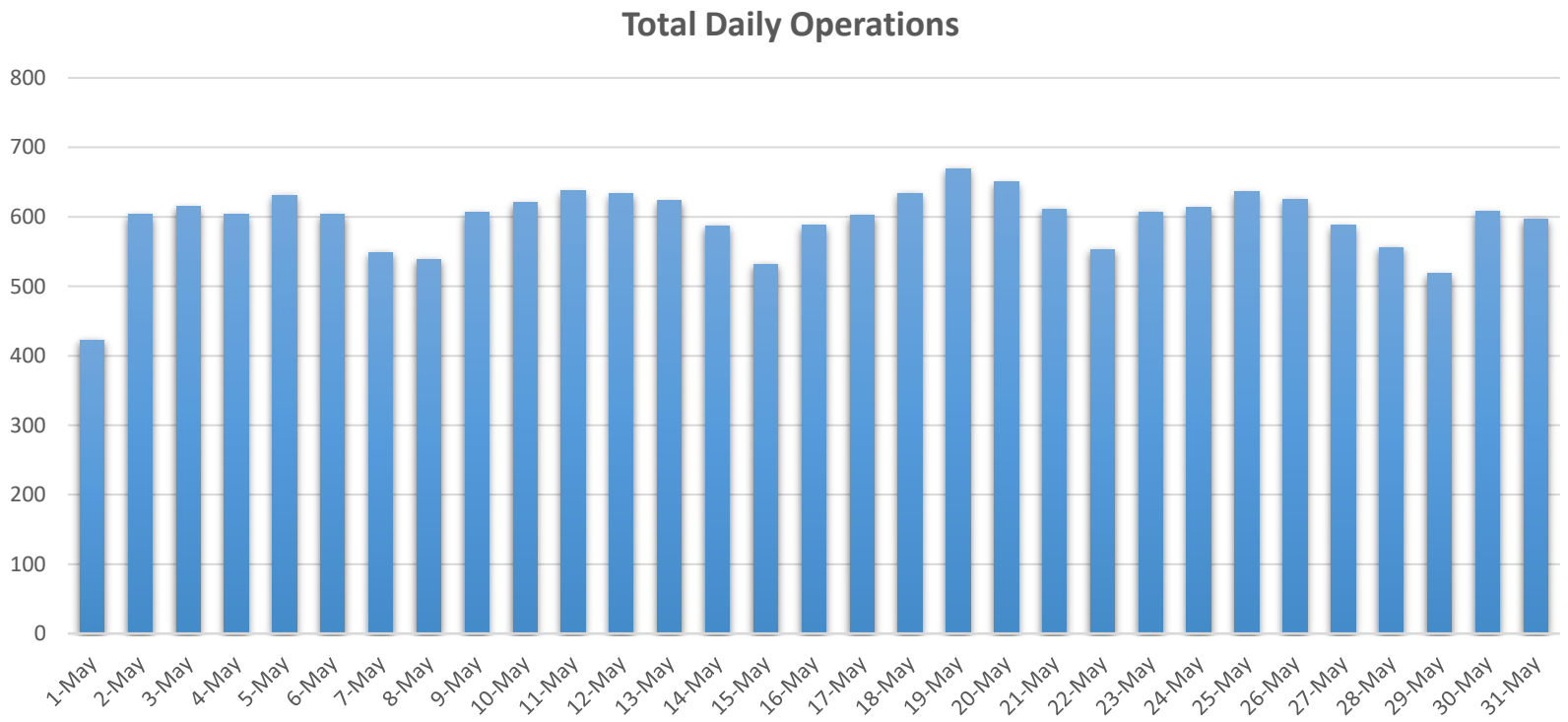
www.vianair.com

APPENDIX I:

SUPPLEMENTAL OPERATIONAL STATISTICS



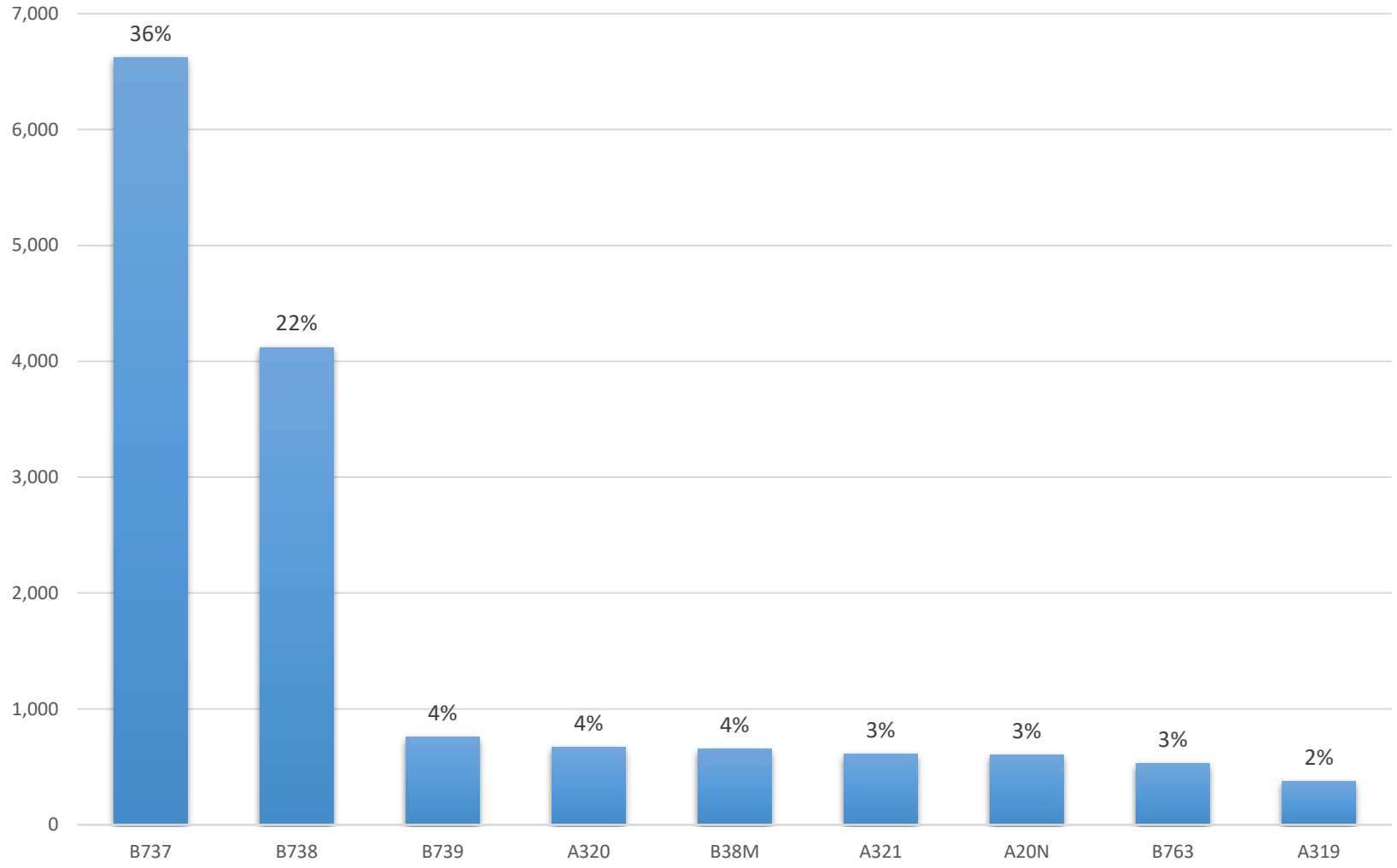
Total Operations



Total Monthly Operations	18,463
Average Daily Operations	596

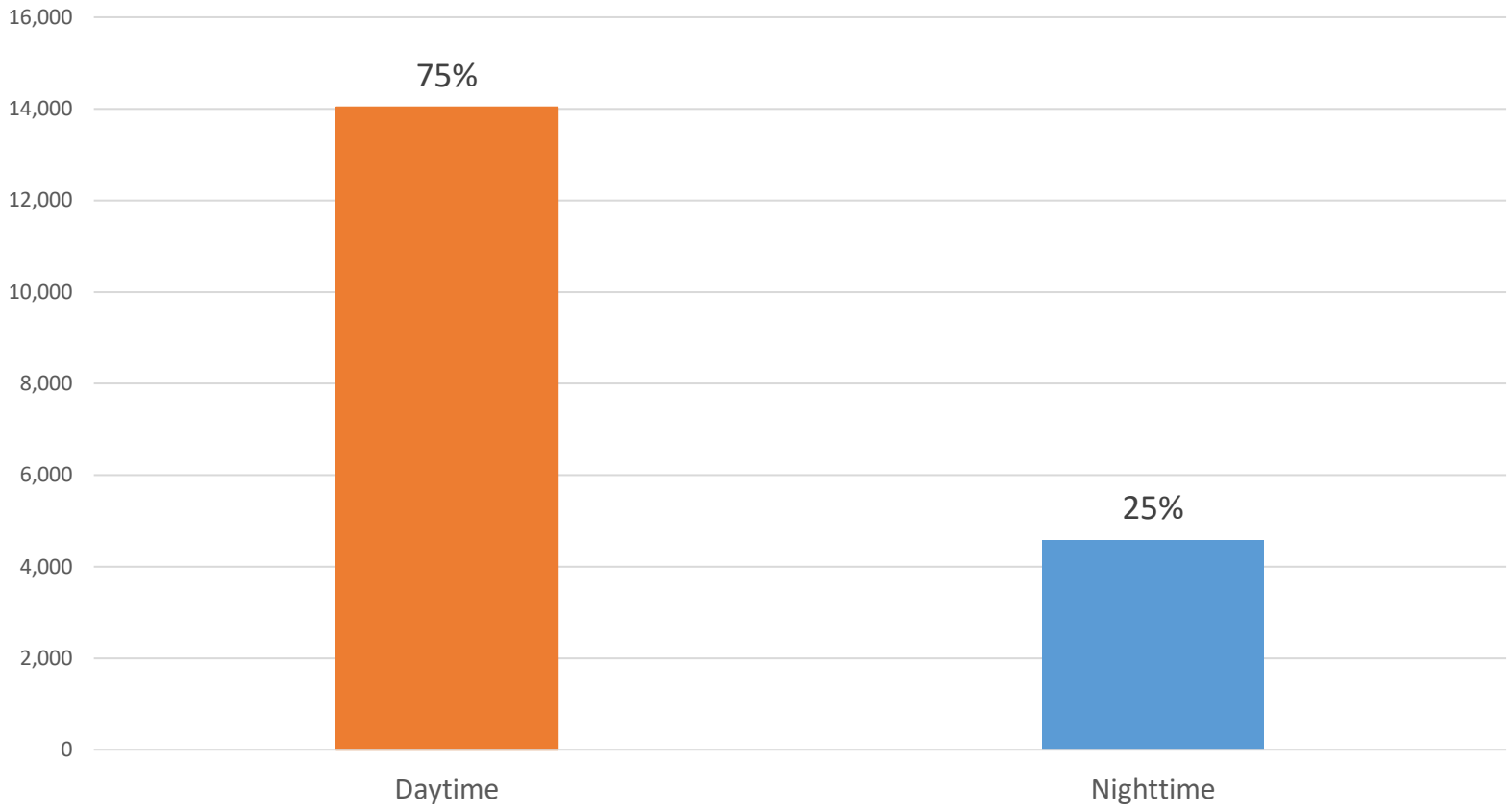
vianair

Fleet Mix: Operations by Aircraft Type (Top 10 Aircraft Types)



vianair

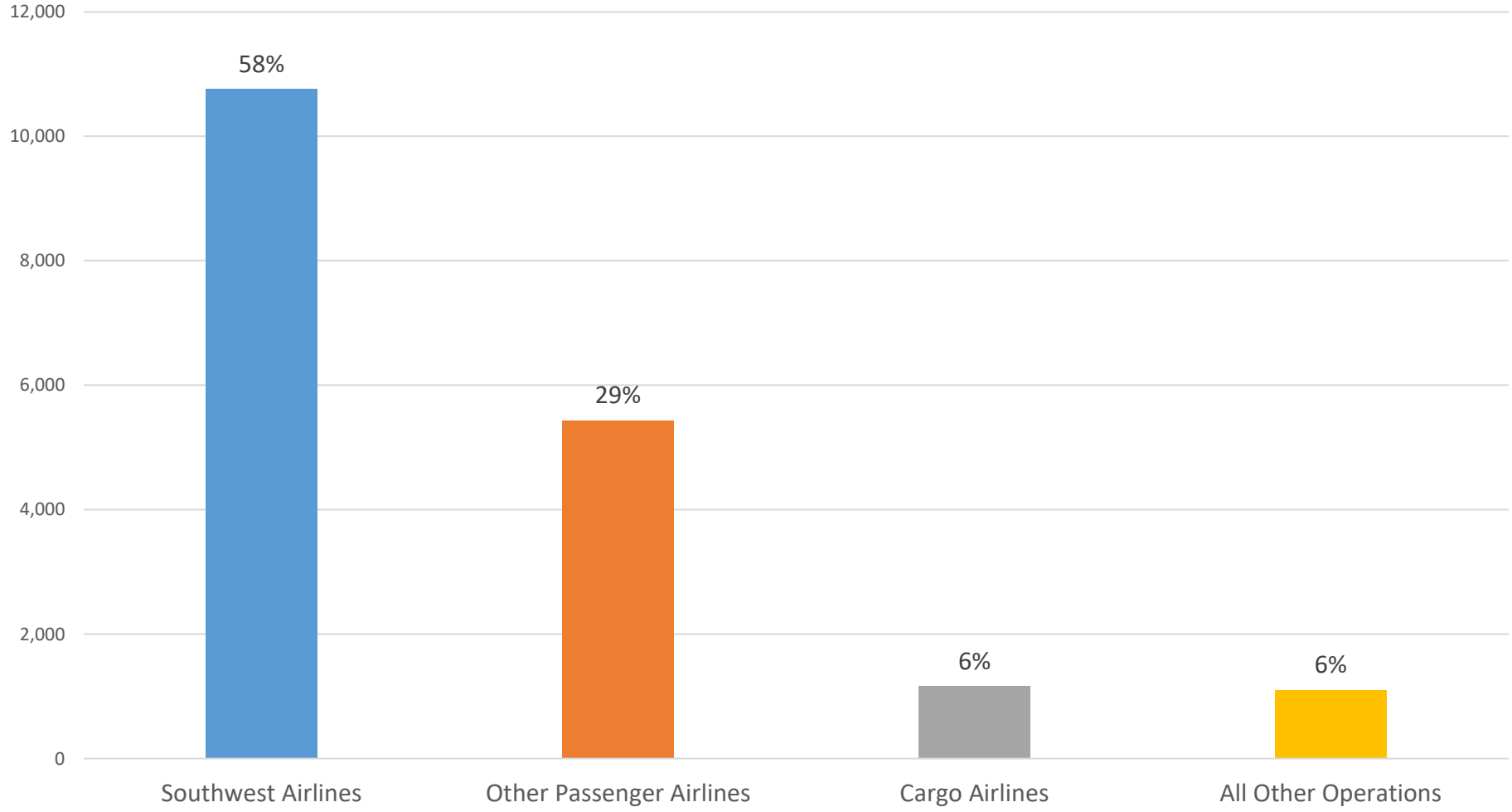
Total Operations: Daytime vs. Nighttime



"Nighttime Hours" are from 10PM - 7AM

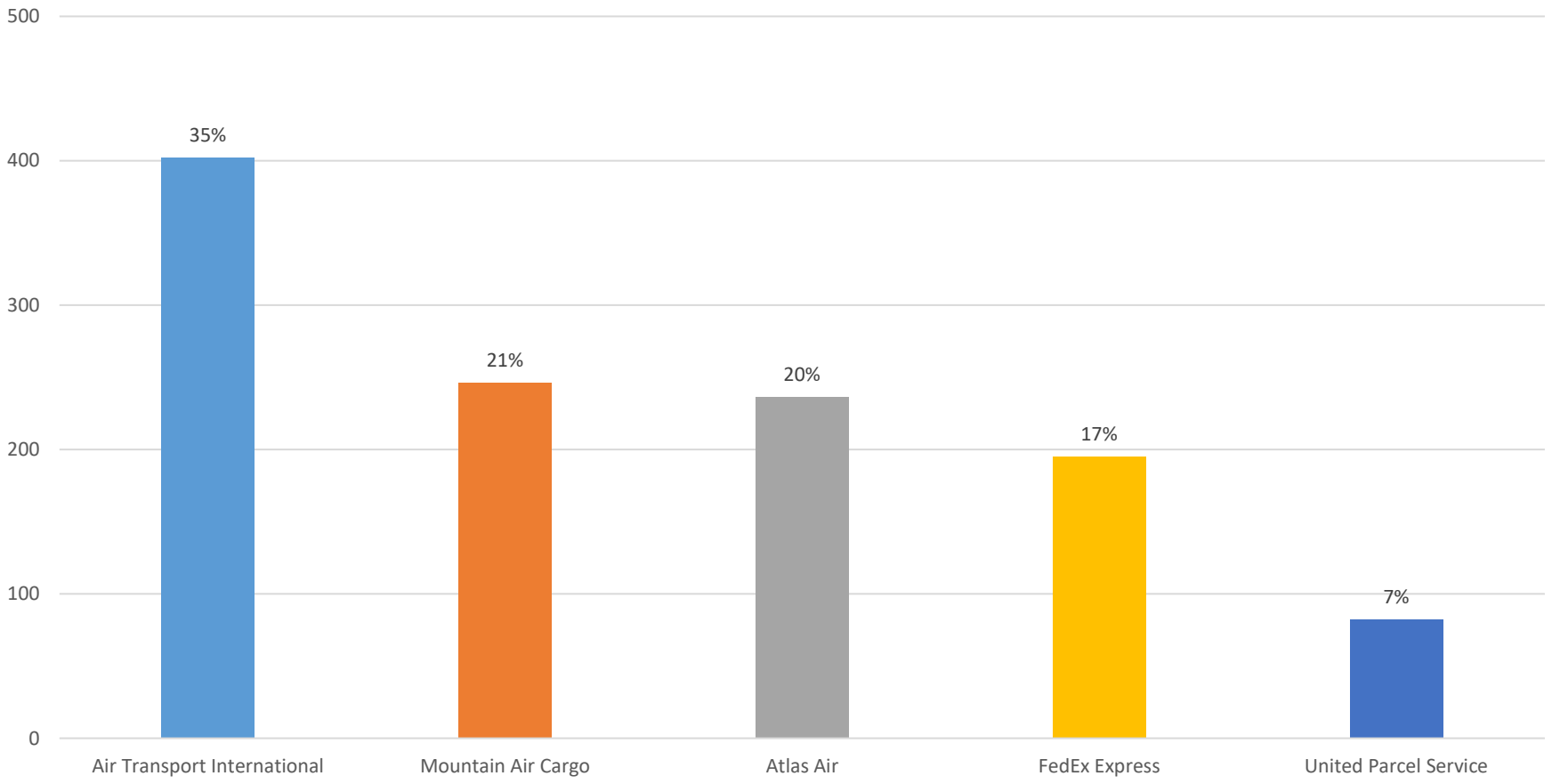
vianair

Total Operations: Southwest Airlines vs. Other



vianair

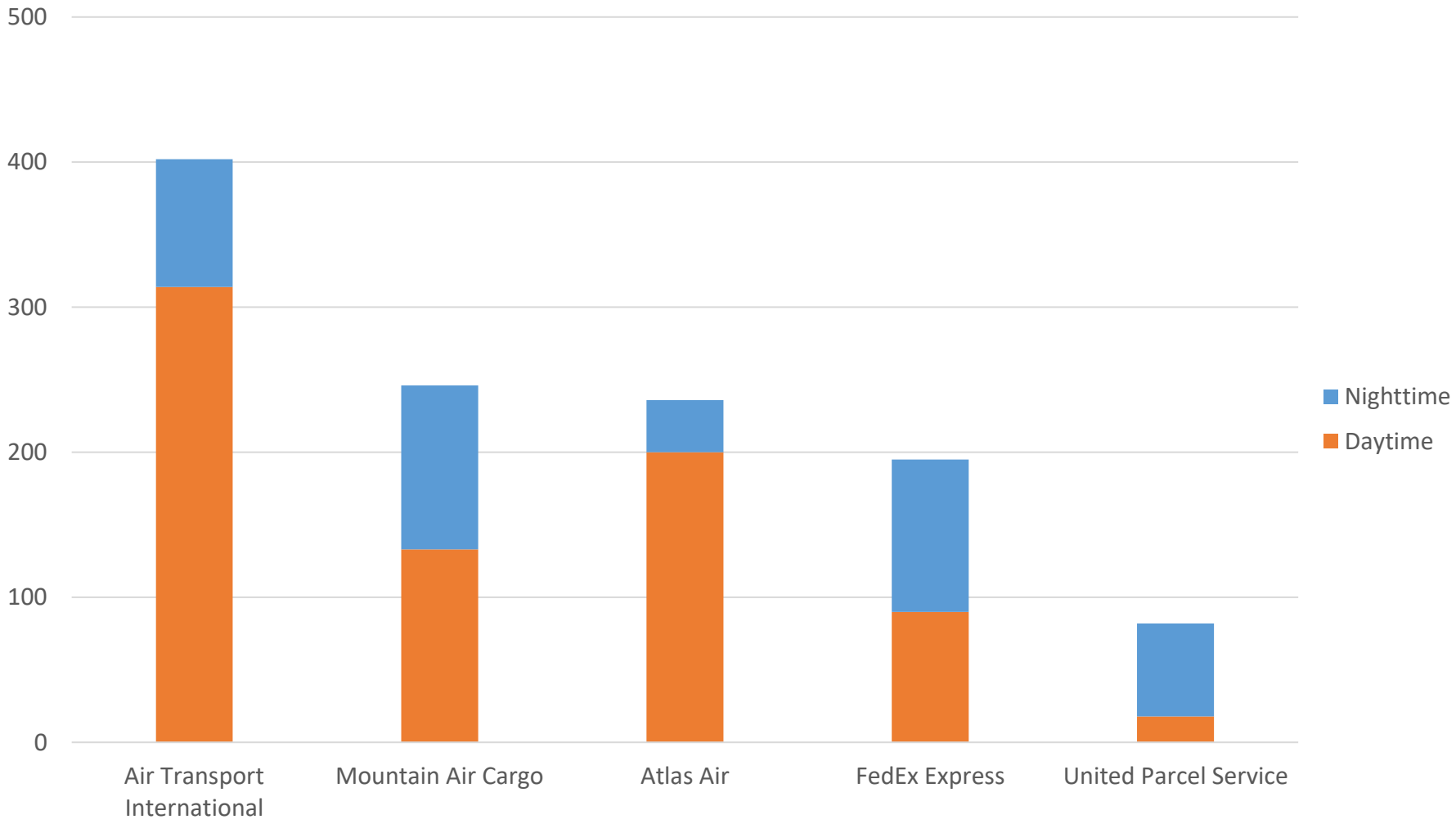
Cargo Operations



This analysis includes the primary cargo operators at BWI.

vianair

Cargo Operations: Daytime versus Nighttime



Nighttime hours are from 10PM-7AM.

vianair