Aircraft Operations and Noise Exposure Monthly Report

September 2022

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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.

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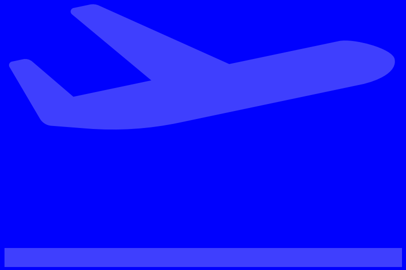
AIRPORT OPERATIONS DATA



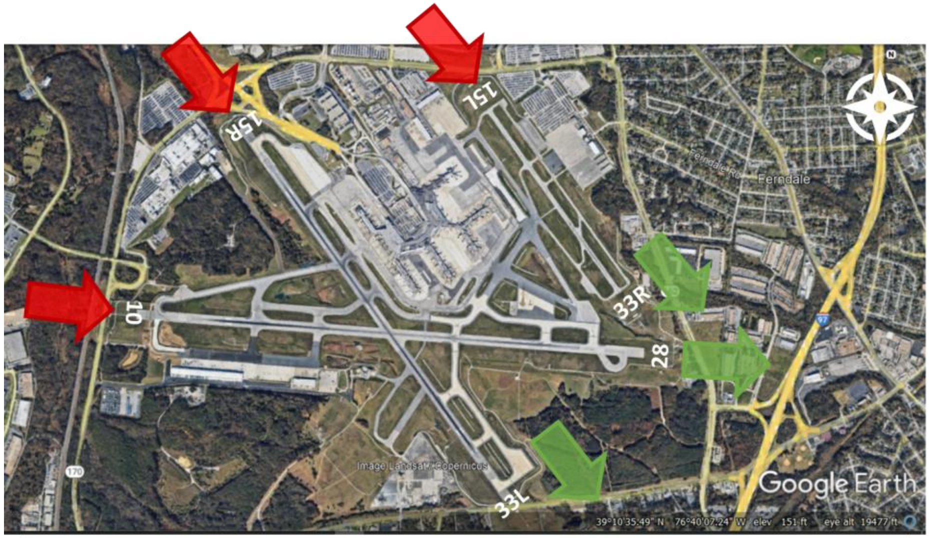
Airport Operations Data

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.

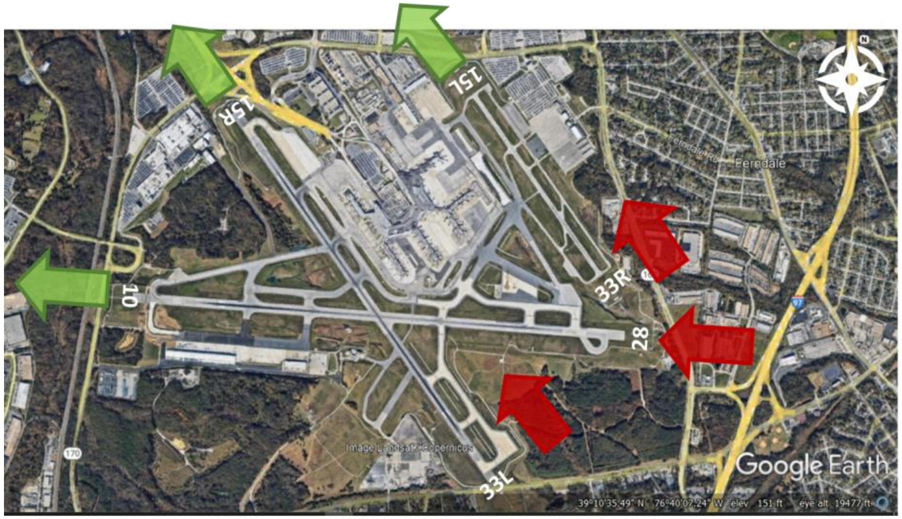
The core operational data sets analyzed in this report include Runway Use and Flight Track Density. Additional, or supplemental operational analyses are included in Appendix I. These include total (daily) operations, operations by aircraft type, daytime versus nighttime operations, and total operations.

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.


15R
15L
10
33R
28
33L
Ferndale Rd
Ferndale
Image Landsat / Copernicus
Google Earth
39°10'35.49" N 76°40'07.24" W elev 151 ft eye alt 19477 ft

EAST FLOW


15R
15L
10
33R
28
33L
Ferndale Rd
Ferndale
Image Landsat / Copernicus
Google Earth
39°10'35.49" N 76°40'07.24" W elev 151 ft eye alt 19477 ft

WEST FLOW

EAST FLOW versus WEST FLOW

During EAST FLOW conditions, aircraft arrive and depart toward the east. This includes runways 15L, 15R, and 10.

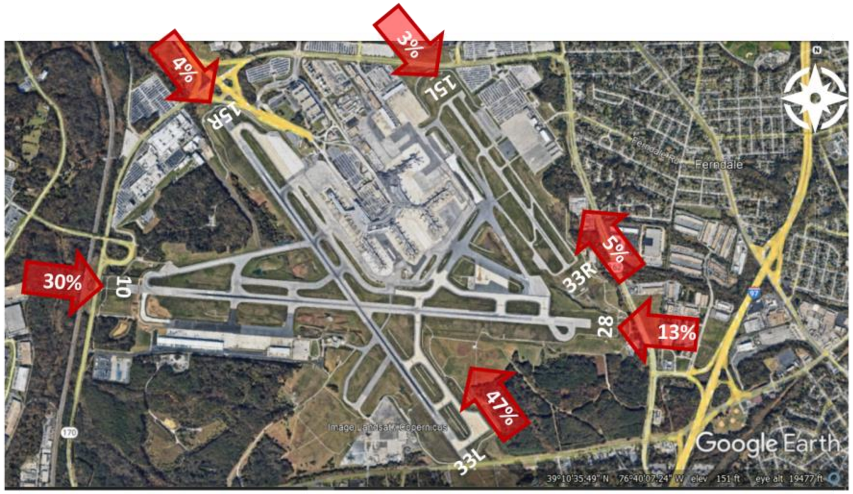
During WEST Flow conditions, aircraft arrive and depart toward the west. This includes runways 33L, 33R, and 28. The following slides are intended to illustrate arrival and departure flight paths during EAST and WEST flows.

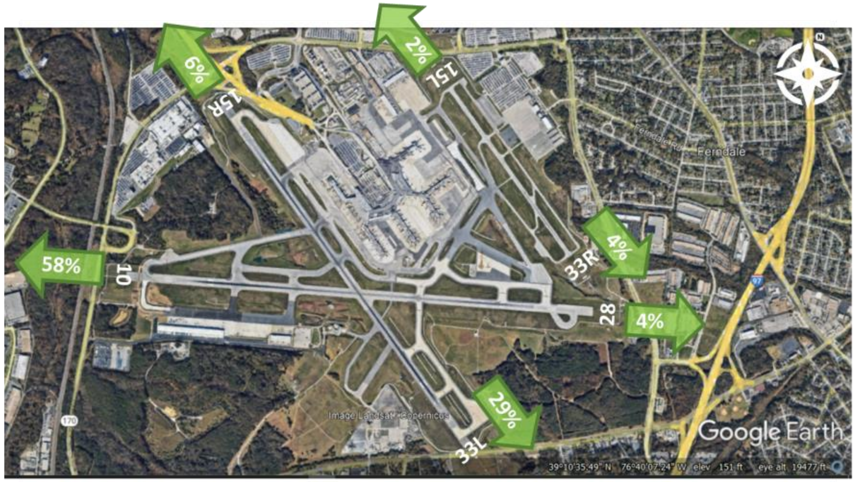
For illustrative purposes, sample days were analyzed and depict arrivals and departures consistent with a specific flow. While these flight patterns are typical, they may vary on other days based on operational conditions.

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.


4%
3%
15L
15R
30%
10
5%
33R
28
13%
47%
33L
Ferndale
Google Earth


6%
2%
15L
15R
58%
10
4%
33R
28
4%
29%
33L
Ferndale
Google Earth

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

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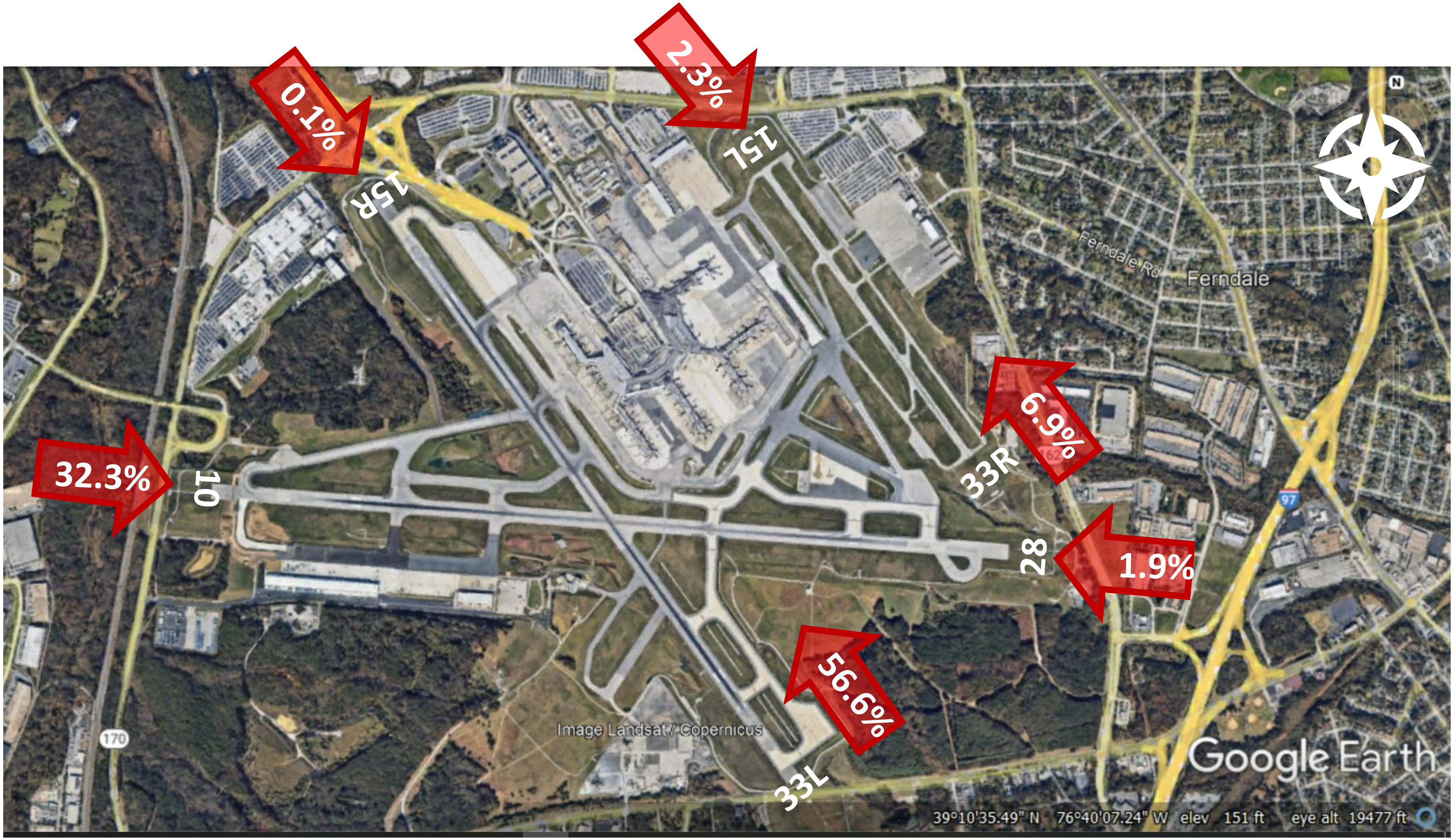
AIRPORT OPERATIONS DATA

Monthly Data

Runway Use - Arrivals



0.1%
2.3%
15R
15L
32.3%
10
6.9%
33R
1.9%
28
56.6%
33L
Ferndale Rd
Ferndale
170
97
Image Landsat / Copernicus
Google Earth
39°10'35.49" N 76°40'07.24" W elev 151 ft eye alt 19477 ft

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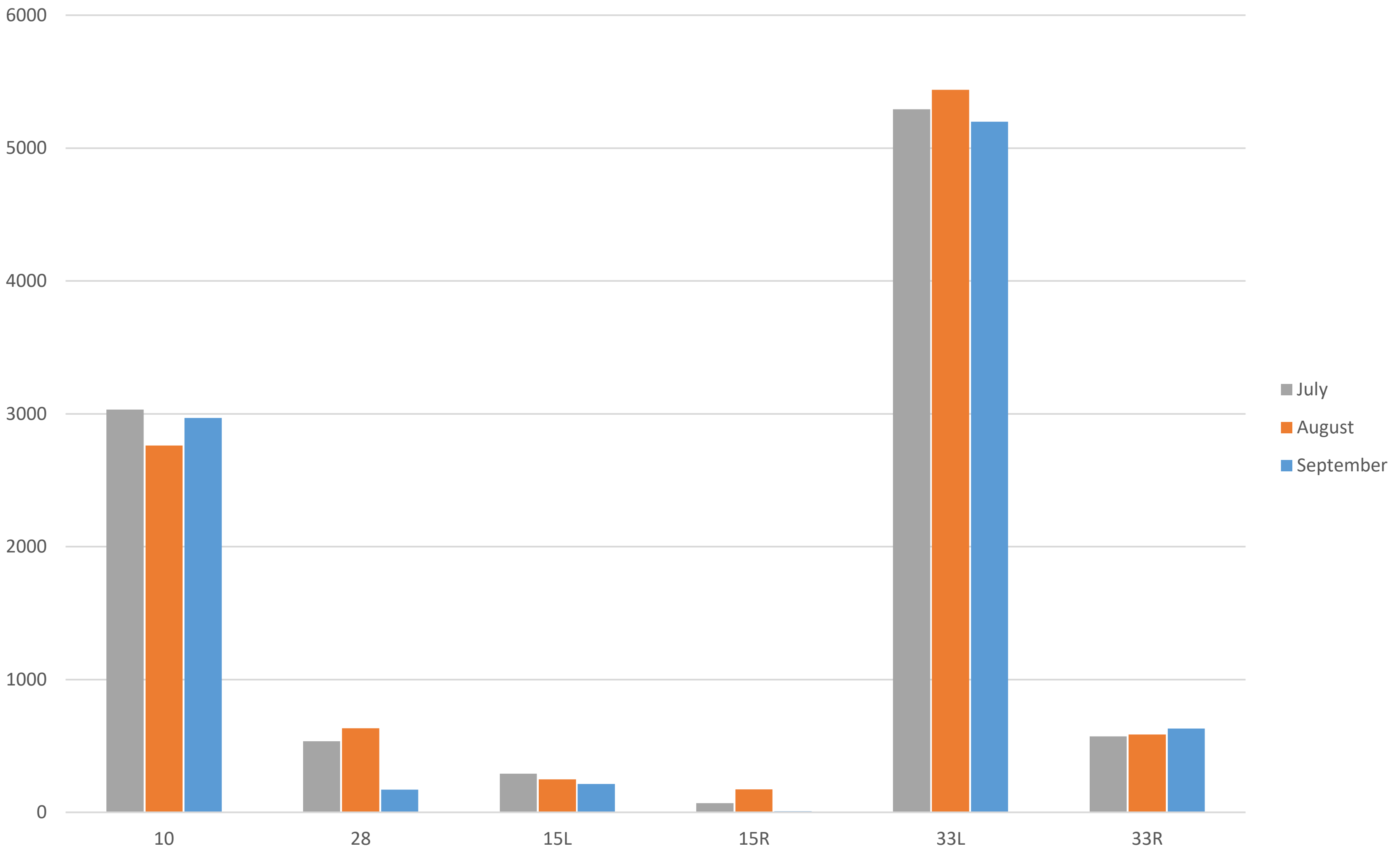
Runway Use - Arrivals



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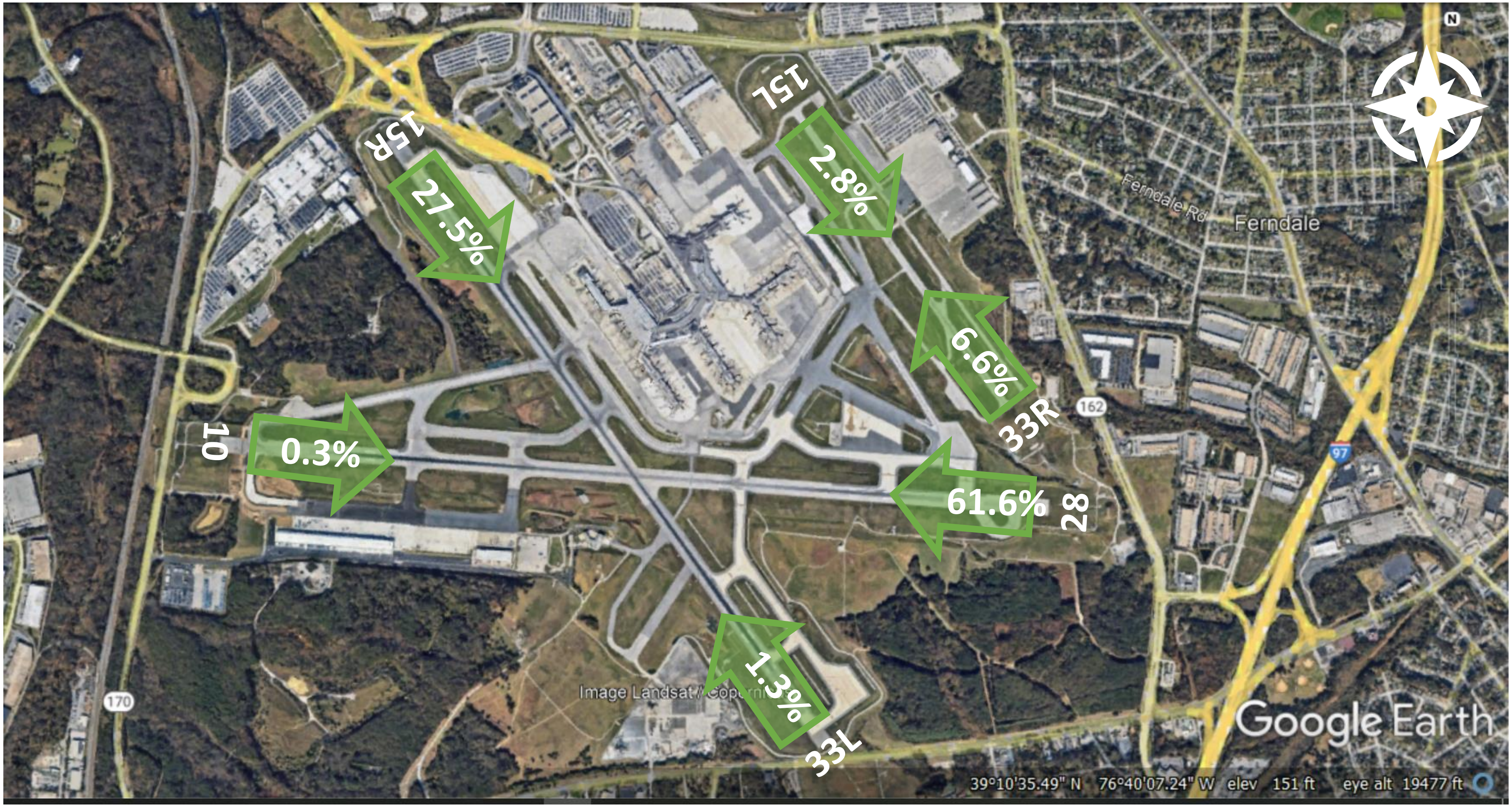
Runway Use - Arrivals


15L
2.8%
15R
27.5%
6.6%
33R
10
0.3%
61.6%
28
1.3%
33L
Ferndale Rd
Ferndale
162
97
170
Image Landsat / Copernicus
Google Earth
39°10'35.49" N 76°40'07.24" W elev 151 ft eye alt 19477 ft

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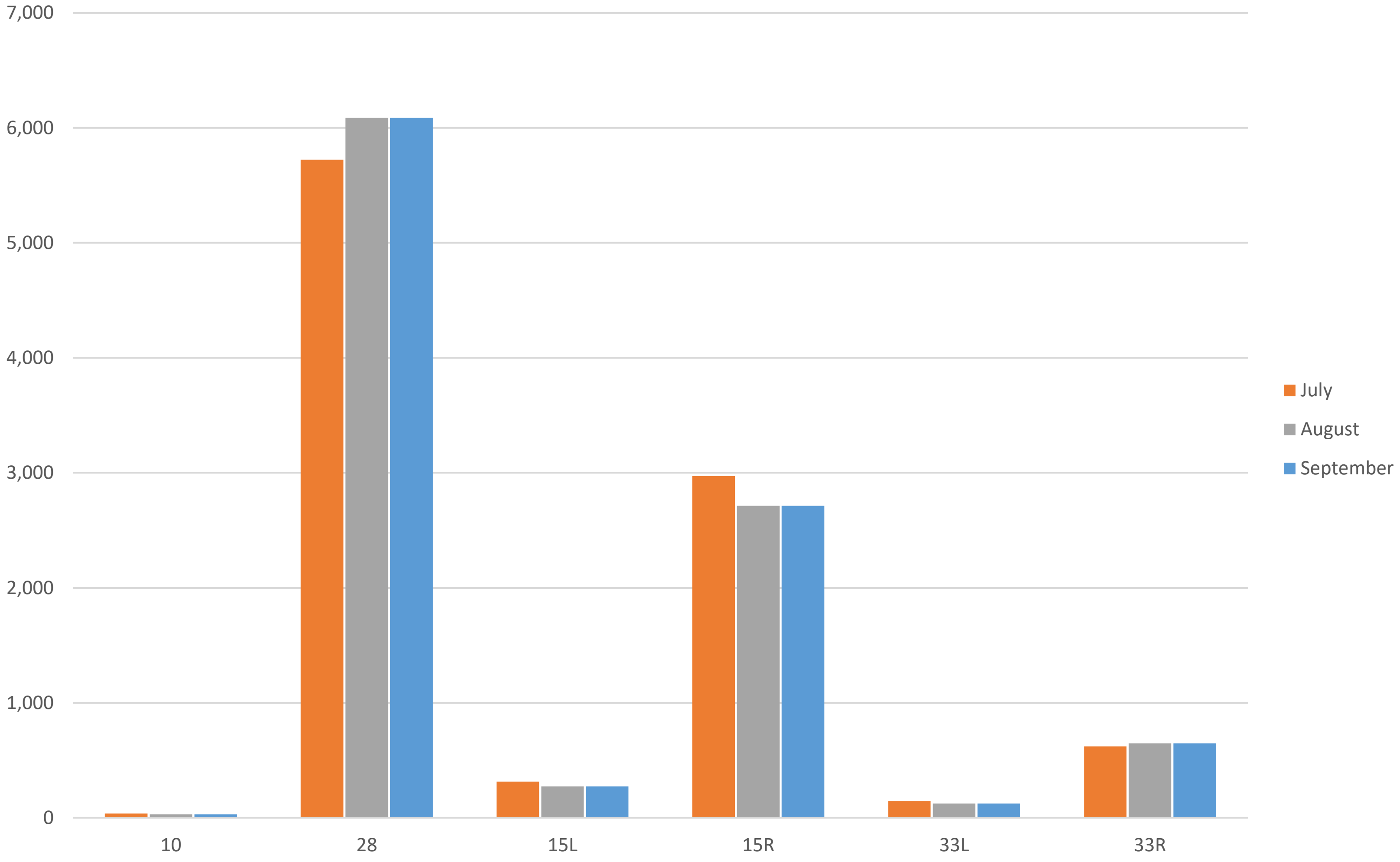
Runway Use - Departures



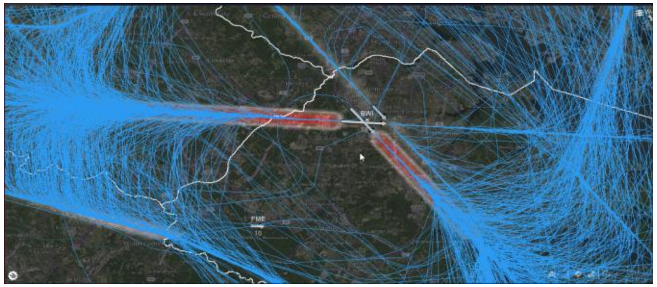
Density Analyses

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.

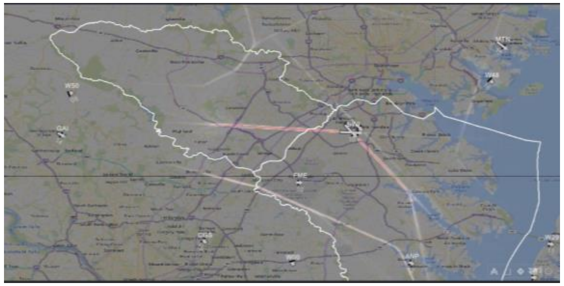
Flight track density analyzes the concentrations of flight activity in and out of BWI. Flight track density is calculated based on reviewing all flights for the month, then analyzing the concentration of flights within the study area. Concentration (or density) is then depicted using color. Red represents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

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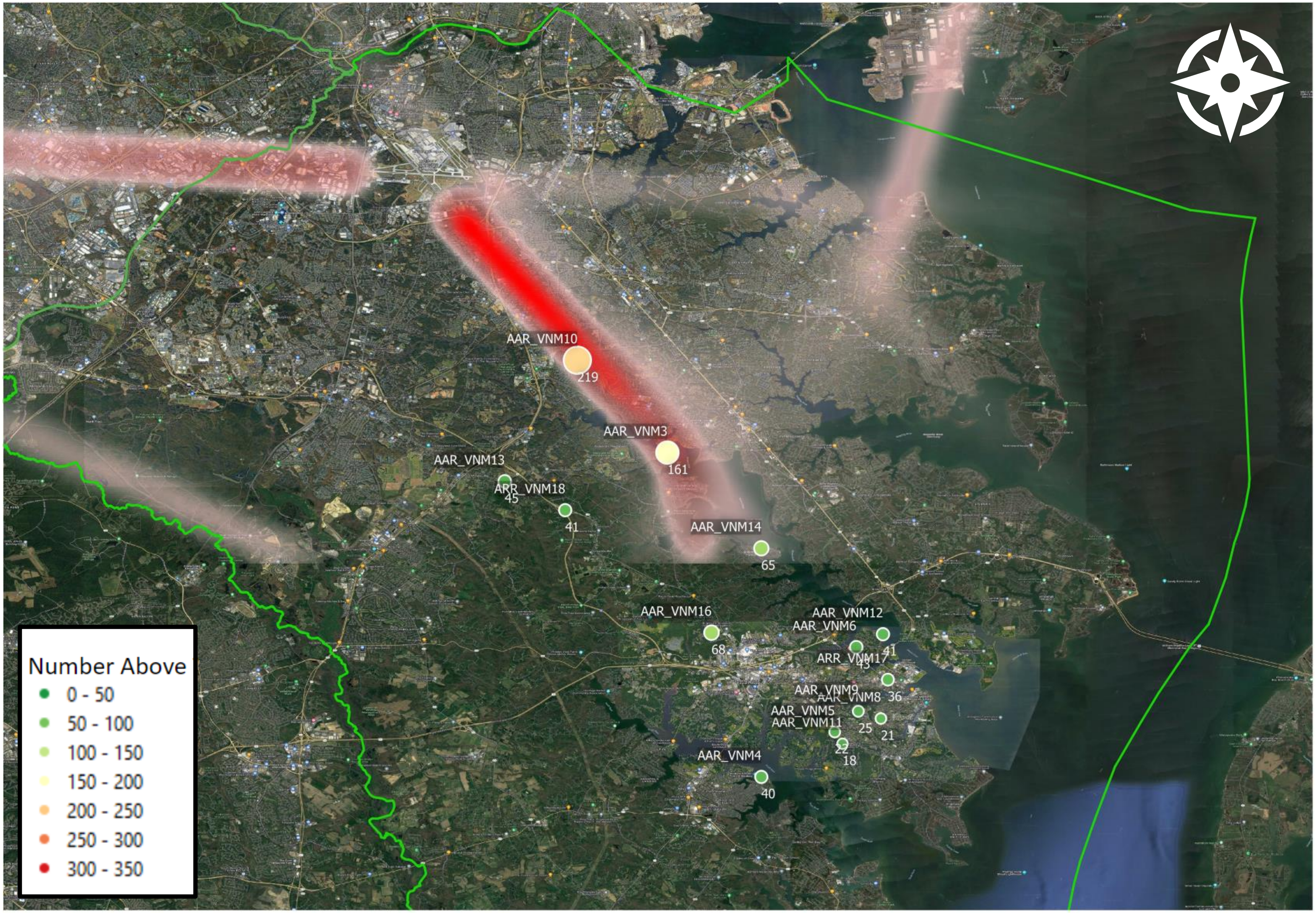
Flight Track Density Analysis – Arrivals (with NA55)

Anne Arundel County


AAR_VNM10
219
AAR_VNM3
161
AAR_VNM13
45
ARR_VNM18
41
AAR_VNM14
65
AAR_VNM16
68
AAR_VNM12
AAR_VNM6
41
ARR_VNM17
43
AAR_VNM9
AAR_VNM8
36
AAR_VNM5
AAR_VNM11
25
21
22
18
AAR_VNM4
40
Number Above
0 - 50
50 - 100
100 - 150
150 - 200
200 - 250
250 - 300
300 - 350

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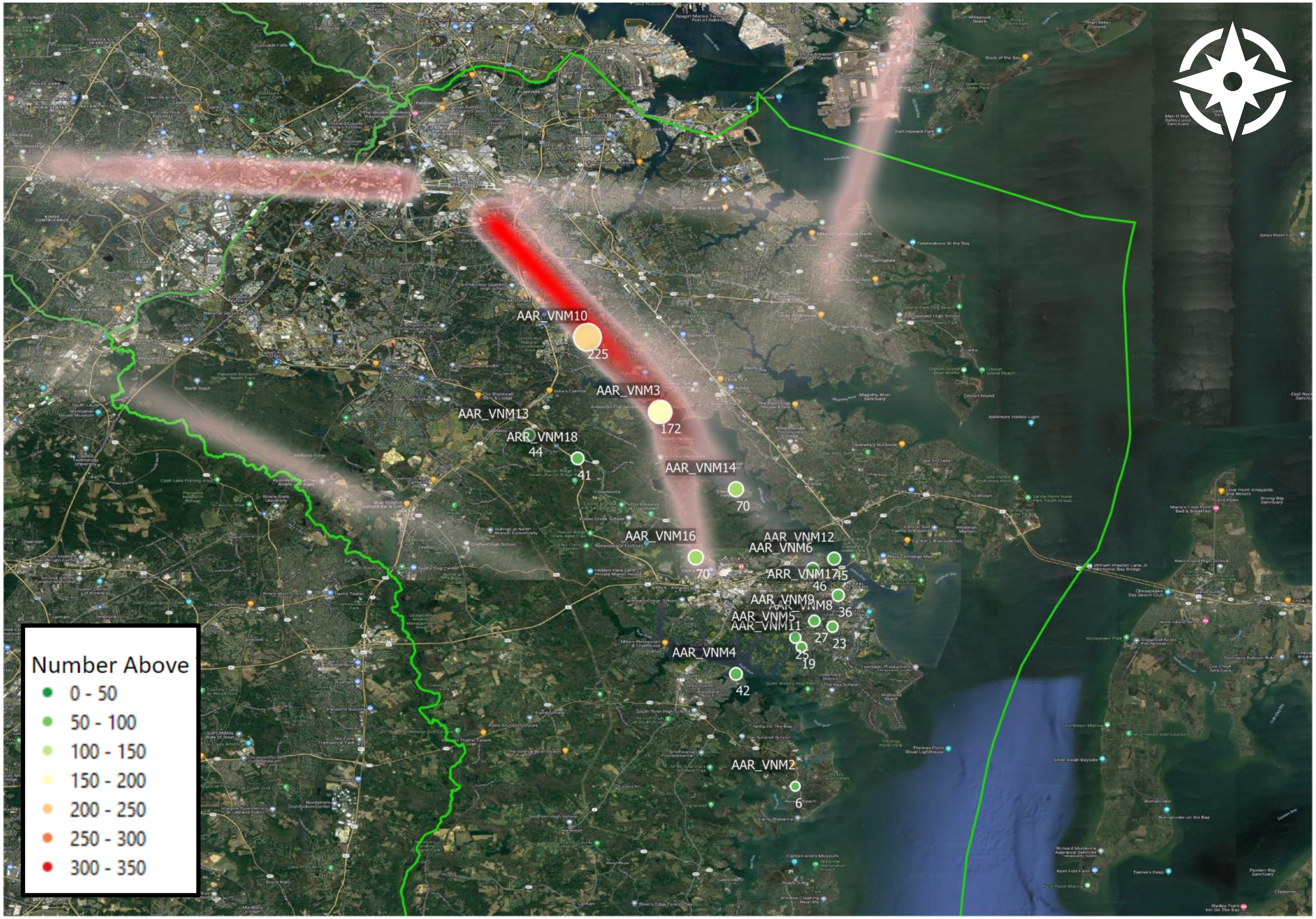
Flight Track Density Analysis – Arrivals (with NA55)

Anne Arundel County


AAR_VNM10
225
AAR_VNM3
172
AAR_VNM13
ARR_VNM18
44
41
AAR_VNM14
70
AAR_VNM16
70
AAR_VNM12
AAR_VNM6
ARR_VNM17
15
46
AAR_VNM9
AAR_VNM8
36
AAR_VNM5
AAR_VNM11
27
23
25
19
AAR_VNM4
42
AAR_VNM2
6
Number Above
0 - 50
50 - 100
100 - 150
150 - 200
200 - 250
250 - 300
300 - 350

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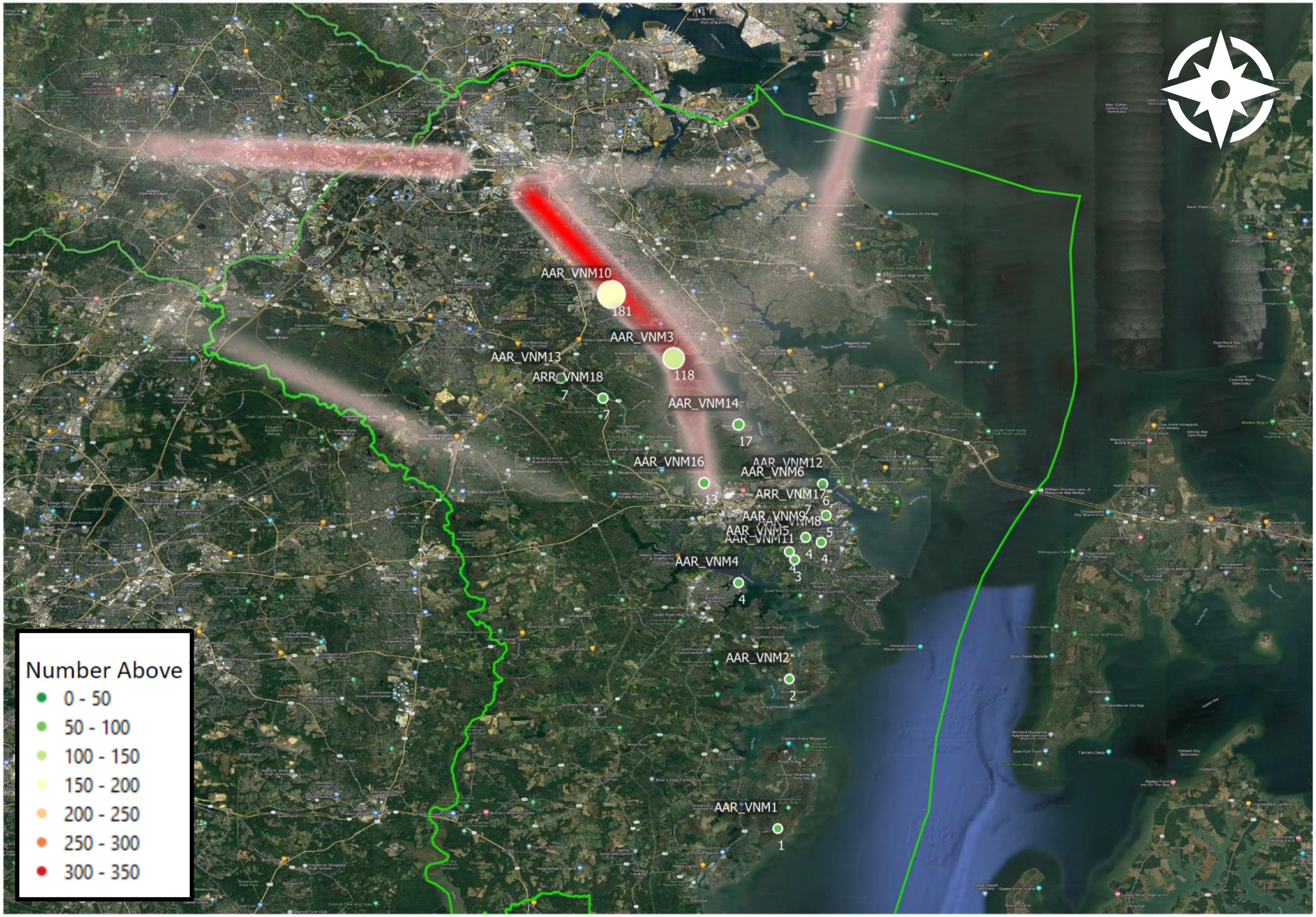
Flight Track Density Analysis – Arrivals (with NA65)

Anne Arundel County


AAR_VNM10
181
AAR_VNM3
118
AAR_VNM13
ARR_VNM18
7
7
AAR_VNM14
17
AAR_VNM16
13
AAR_VNM12
AAR_VNM6
ARR_VNM17
6
7
AAR_VNM9
AAR_VNM8
AAR_VNM5
AAR_VNM11
5
4
4
4
3
AAR_VNM4
4
AAR_VNM2
2
AAR_VNM1
1
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

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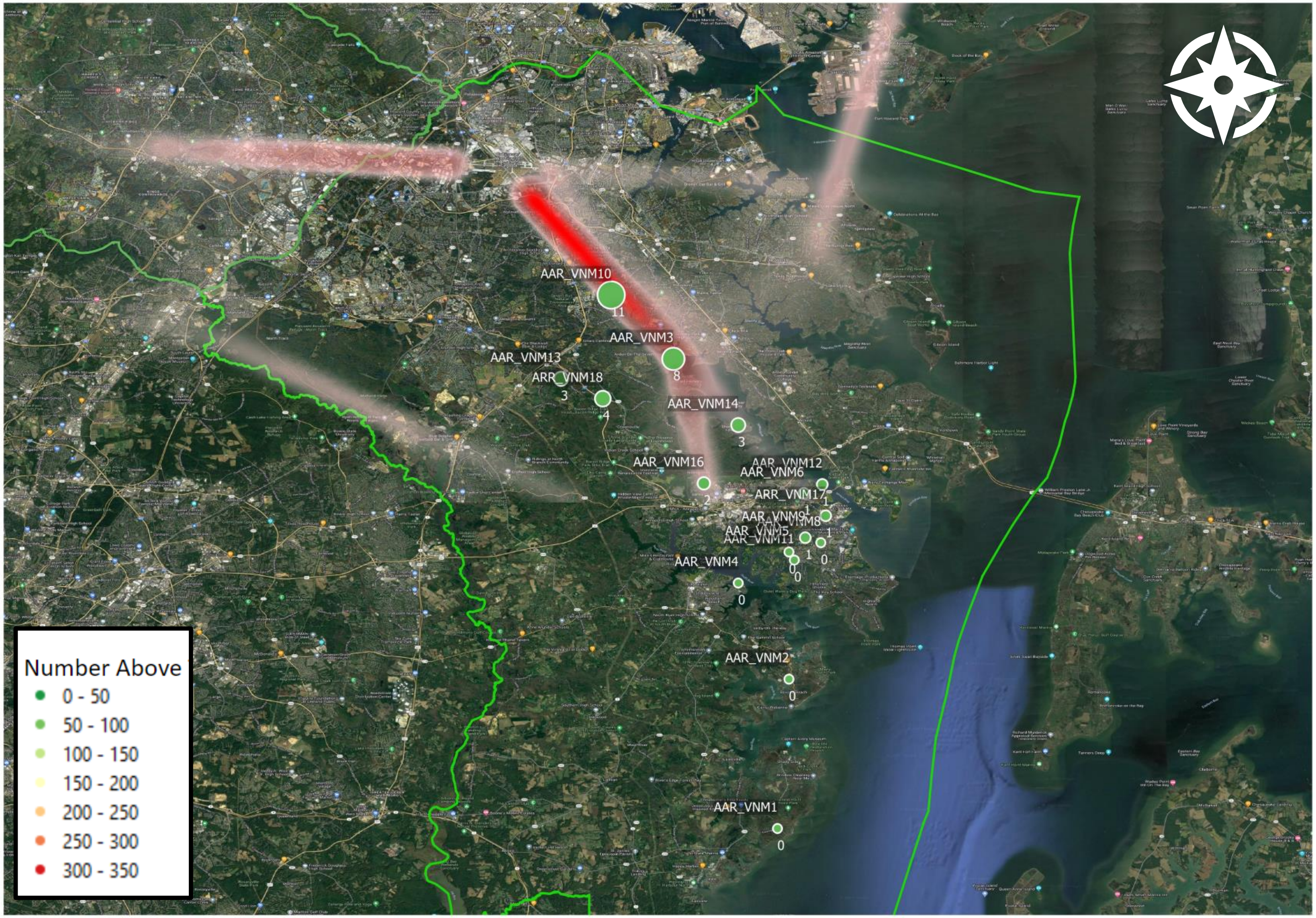
Flight Track Density Analysis – Arrivals (with NA75)

Anne Arundel County


AAR_VNM10
11
AAR_VNM3
8
AAR_VNM13
ARR_VNM18
3
4
AAR_VNM14
3
AAR_VNM16
2
AAR_VNM12
AAR_VNM6
ARR_VNM17
1
AAR_VNM9
AAR_VNM8
AAR_VNM5
AAR_VNM11
1
1
1
0
0
0
AAR_VNM4
0
AAR_VNM2
0
AAR_VNM1
0
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

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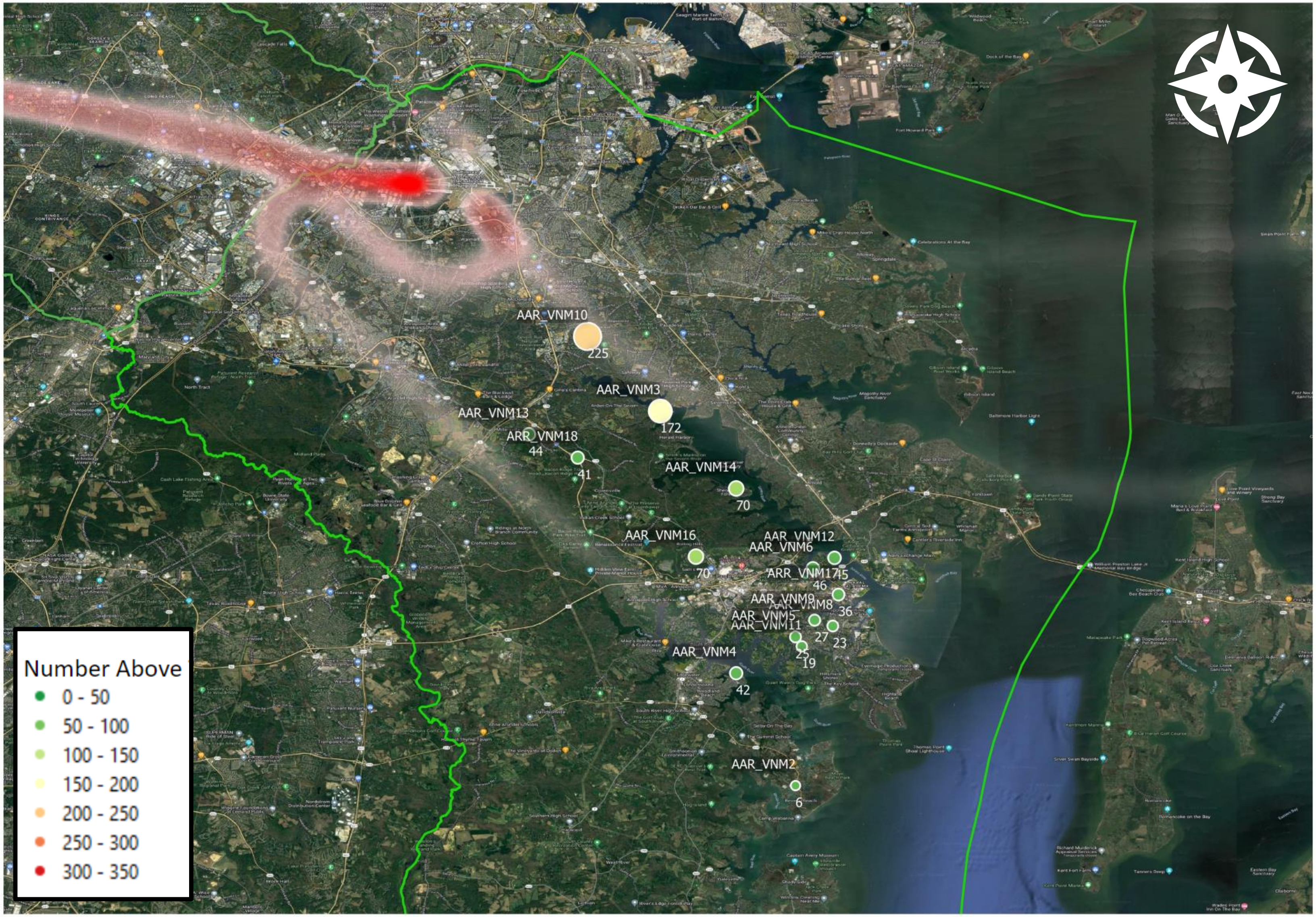
Flight Track Density Analysis – Departures (with NA55)

Anne Arundel County


AAR_VNM10
225
AAR_VNM3
172
AAR_VNM13
ARR_VNM18
44
41
AAR_VNM14
70
AAR_VNM16
70
AAR_VNM12
AAR_VNM6
ARR_VNM17
15
46
AAR_VNM9
AAR_VNM8
36
AAR_VNM5
AAR_VNM11
27
23
25
19
AAR_VNM4
42
AAR_VNM2
6
Number Above
0 - 50
50 - 100
100 - 150
150 - 200
200 - 250
250 - 300
300 - 350

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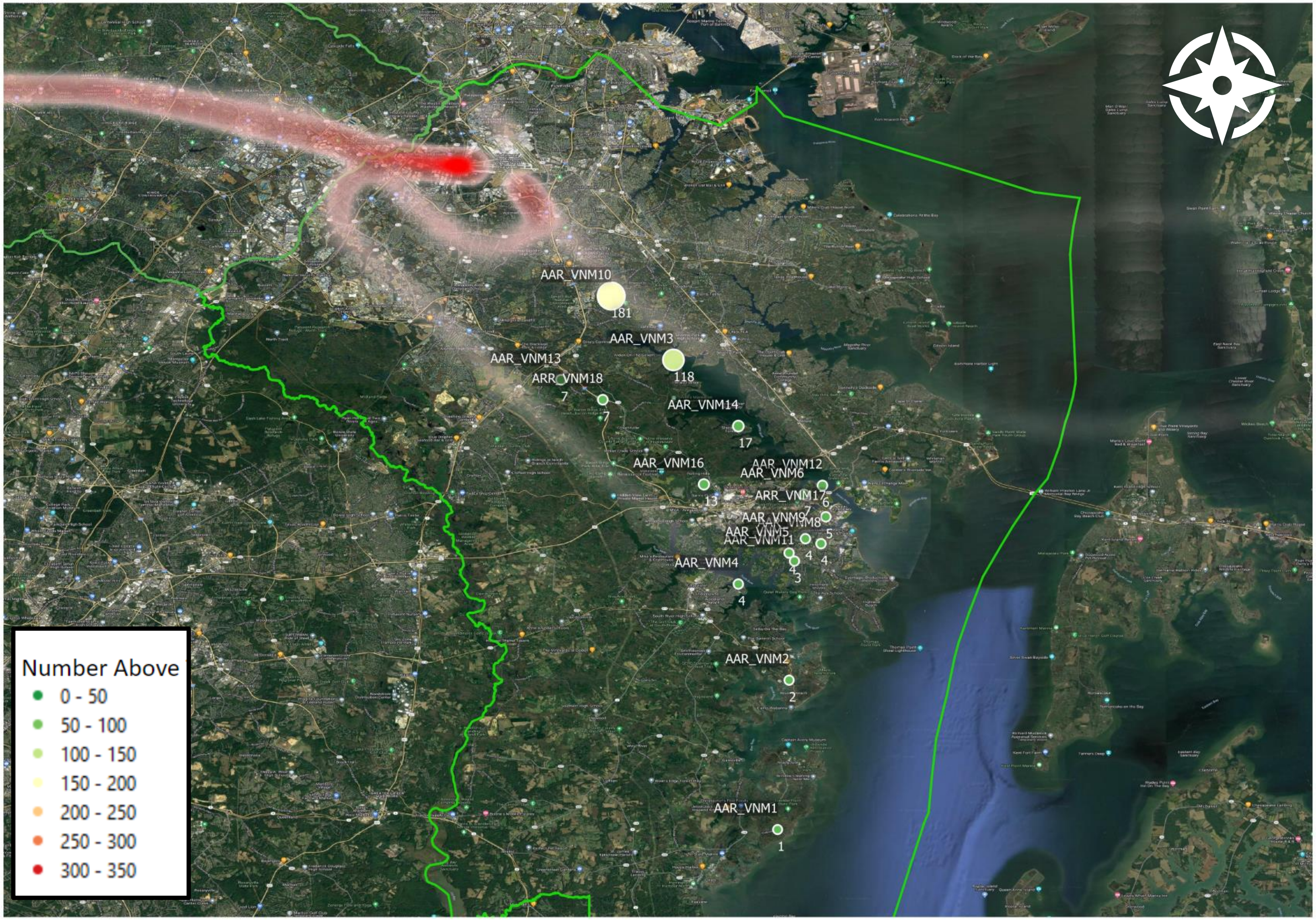
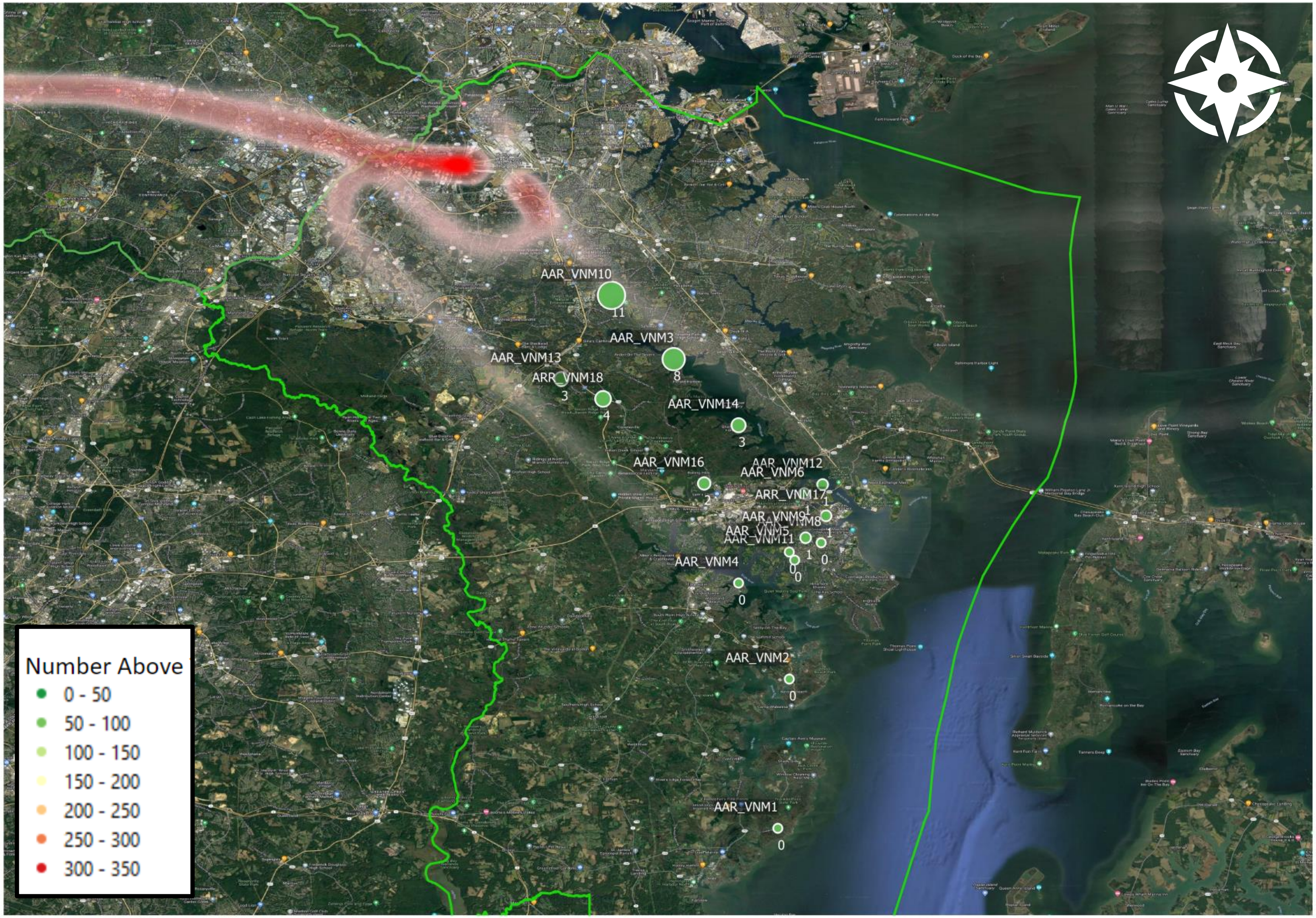
Flight Track Density Analysis – Departures (with NA65)

Anne Arundel County


AAR_VNM10
181
AAR_VNM3
118
AAR_VNM13
ARR_VNM18
7
7
AAR_VNM14
17
AAR_VNM16
13
AAR_VNM12
AAR_VNM6
ARR_VNM17
6
AAR_VNM9
7
AAR_VNM8
5
AAR_VNM5
AAR_VNM11
4
4
4
3
AAR_VNM4
4
AAR_VNM2
2
AAR_VNM1
1
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

Flight Track Density Analysis – Departures (with NA75)

Anne Arundel County


AAR_VNM10
11
AAR_VNM3
8
AAR_VNM13
ARR_VNM18
3
4
AAR_VNM14
3
AAR_VNM16
2
AAR_VNM12
AAR_VNM6
ARR_VNM17
1
1
AAR_VNM9
AAR_VNM8
1
AAR_VNM5
AAR_VNM11
1
0
0
0
AAR_VNM4
0
AAR_VNM2
0
AAR_VNM1
0
Number Above
0 - 50
50 - 100
100 - 150
150 - 200
200 - 250
250 - 300
300 - 350

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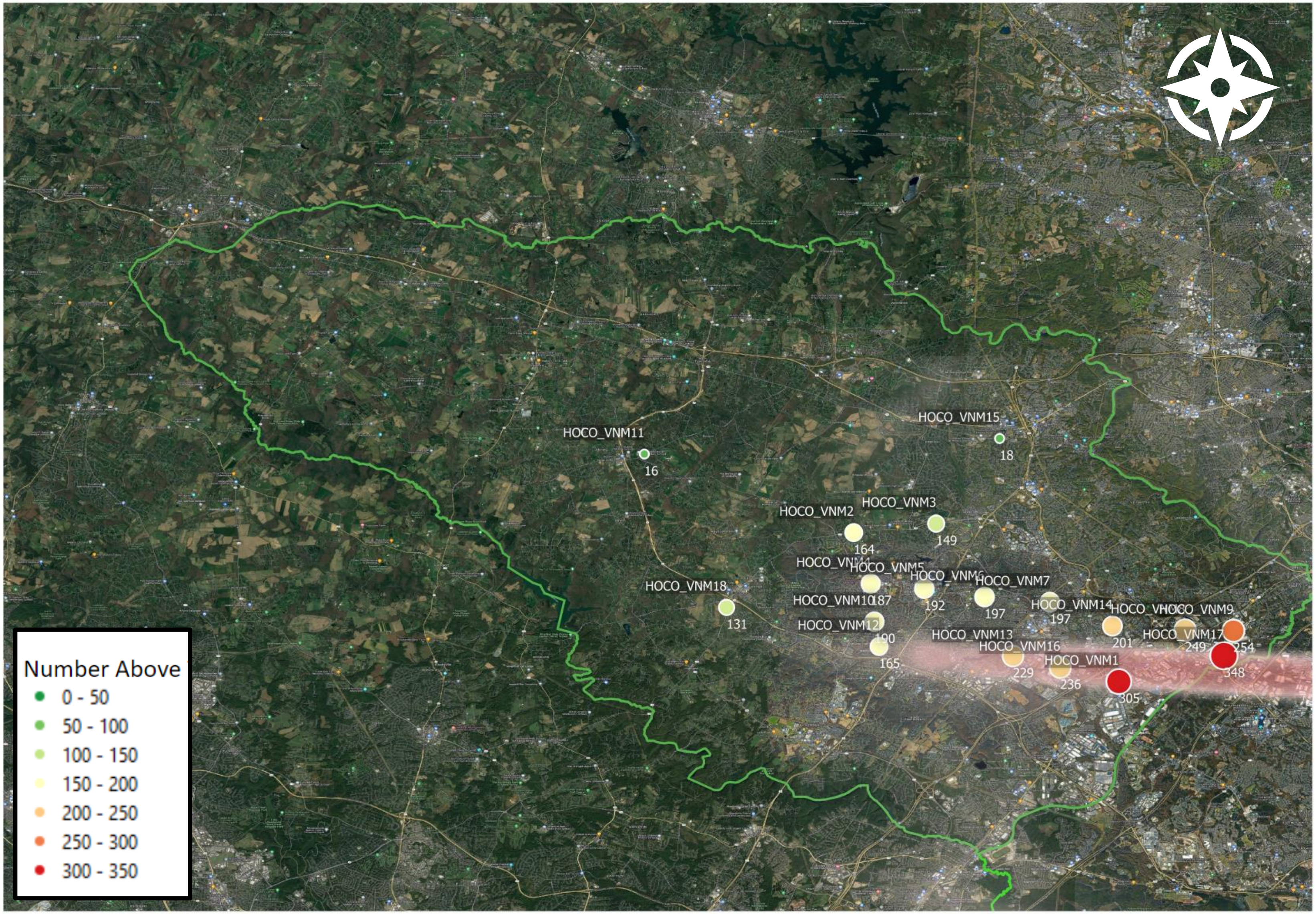
Flight Track Density Analysis – Arrivals (with NA55)

Howard County


HOCO_VNM11
16
HOCO_VNM15
18
HOCO_VNM2
164
HOCO_VNM3
149
HOCO_VN
HOCO_VNM5
HOCO_VNM6
HOCO_VNM7
HOCO_VNM18
131
HOCO_VNM10
187
192
197
HOCO_VNM14
197
HOCO_V
HOCO_VNM9
201
HOCO_VNM12
190
165
HOCO_VNM13
HOCO_VNM16
229
HOCO_VNM1
236
305
HOCO_VNM17
249
254
348
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

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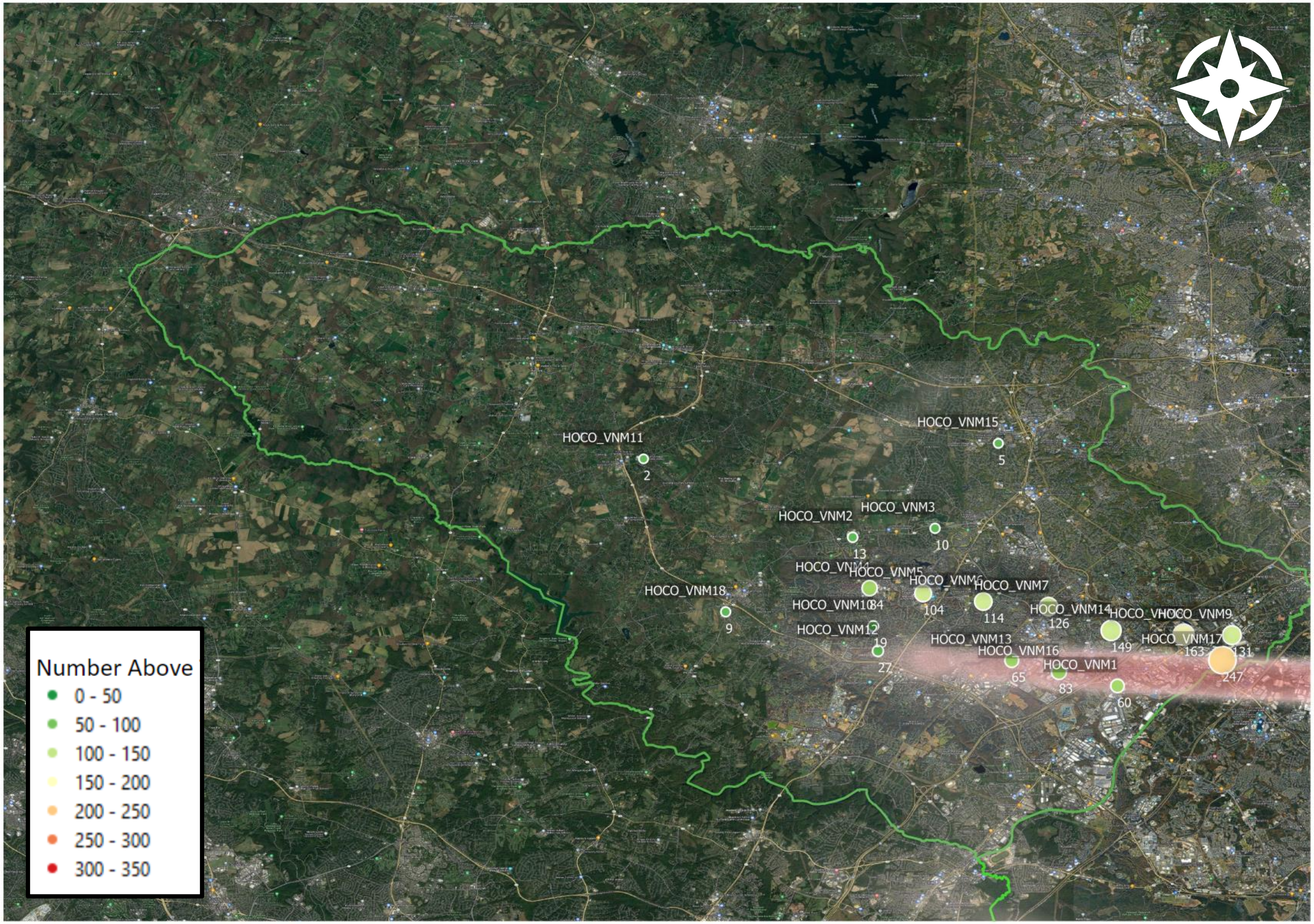
Flight Track Density Analysis – Arrivals (with NA65)

Howard County


HOCO_VNM11
2
HOCO_VNM15
5
HOCO_VNM2
13
HOCO_VNM3
10
HOCO_VNM4
HOCO_VNM5
HOCO_VNM6
HOCO_VNM7
HOCO_VNM18
9
HOCO_VNM10
84
104
114
HOCO_VNM14
126
HOCO_V
HOCO_VNM9
HOCO_VNM12
19
27
HOCO_VNM13
HOCO_VNM16
65
HOCO_VNM1
83
149
HOCO_VNM17
163
131
247
60
Number Above
0 - 50
50 - 100
100 - 150
150 - 200
200 - 250
250 - 300
300 - 350

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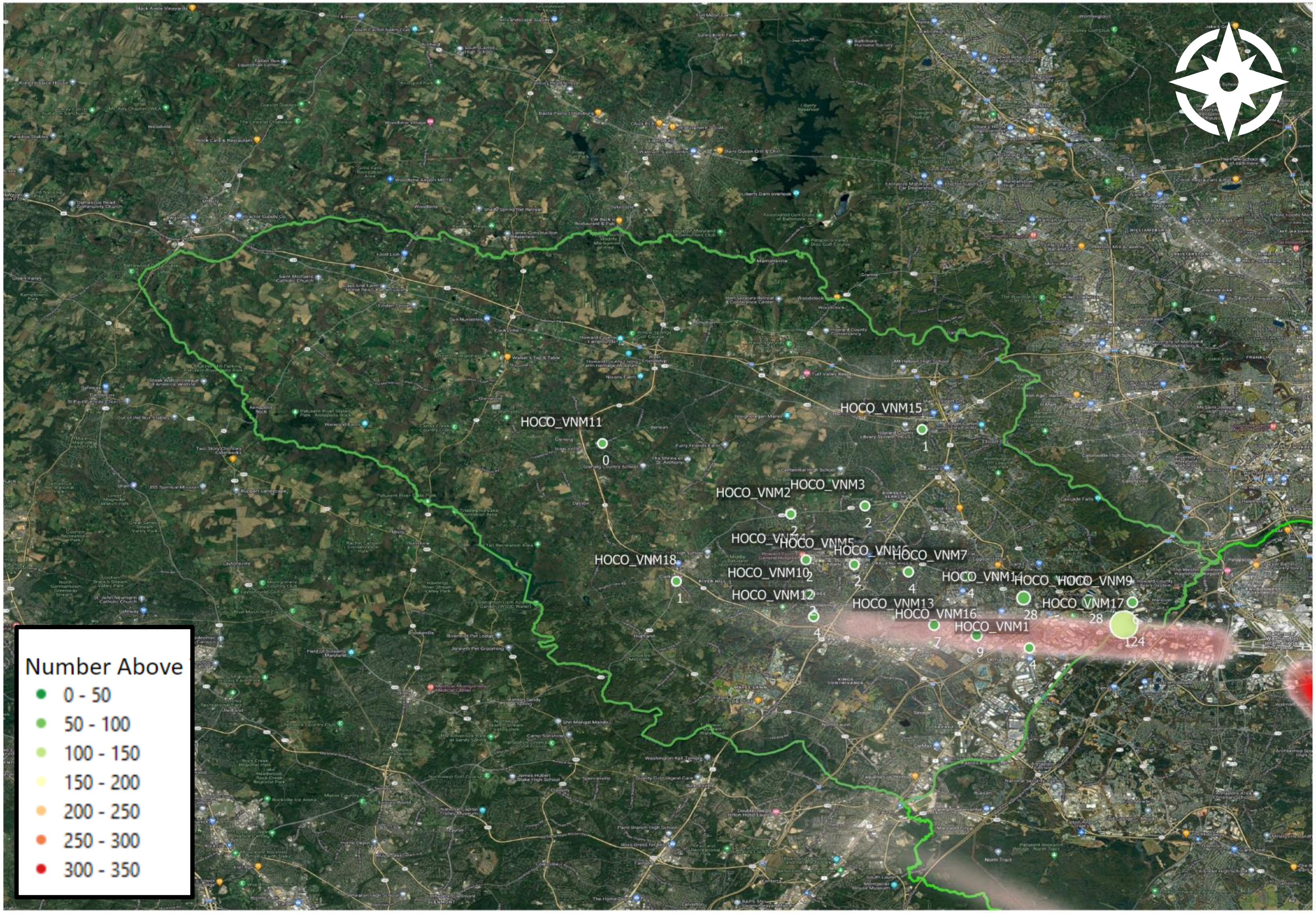
Flight Track Density Analysis – Arrivals (with NA75)

Howard County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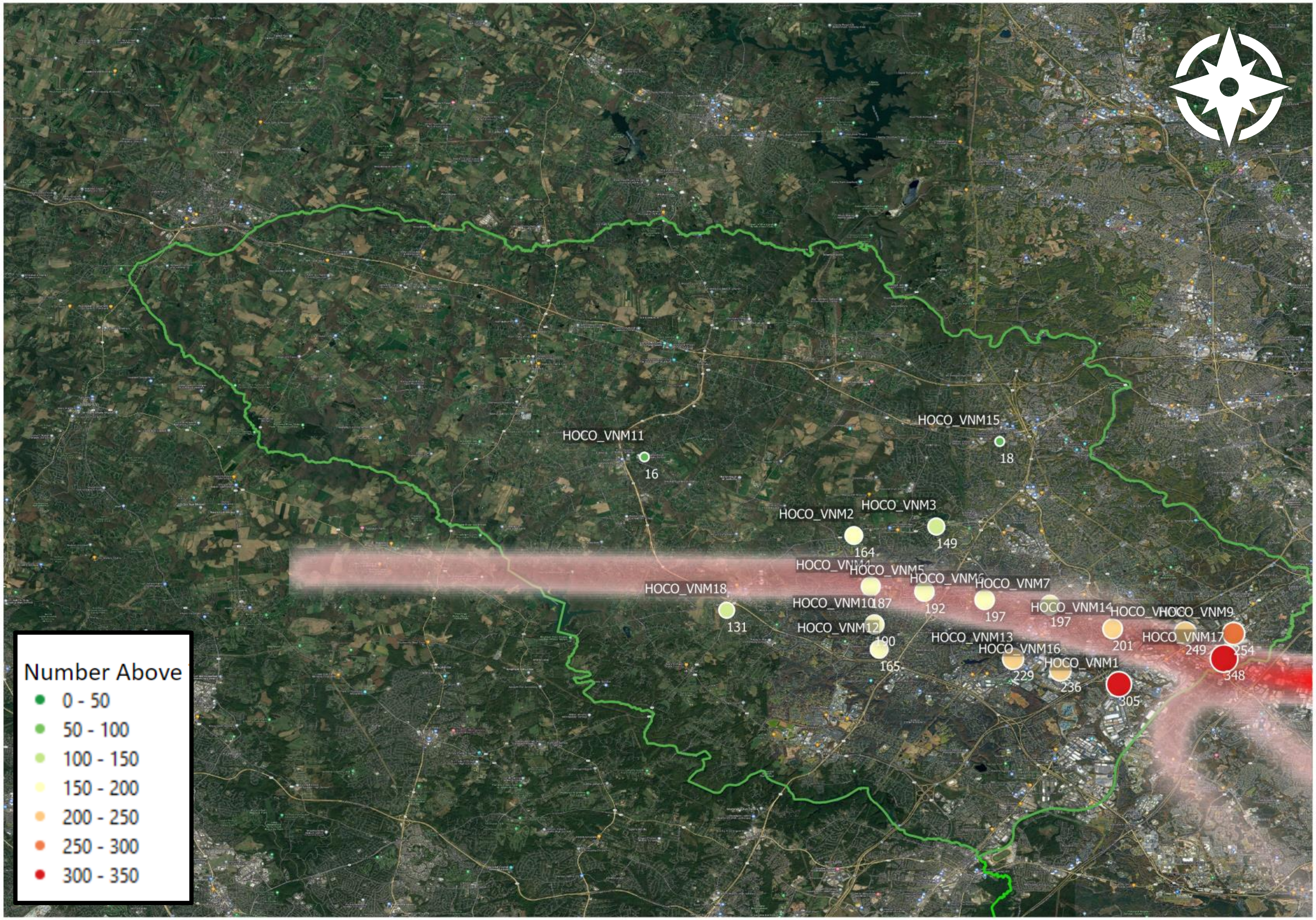
HOCO_VNM15
1
HOCO_VNM2
2
HOCO_VNM3
2
HOCO_VNM4
HOCO_VNM5
HOCO_VNM6
HOCO_VNM7
HOCO_VNM18
1
HOCO_VNM10
2
2
4
HOCO_VNM12
2
4
HOCO_VNM13
HOCO_VNM16
7
HOCO_VNM1
9
4
HOCO_VNM14
4
HOCO_VNM9
28
HOCO_VNM17
28
6
124
Number Above
0 - 50
50 - 100
100 - 150
150 - 200
200 - 250
250 - 300
300 - 350

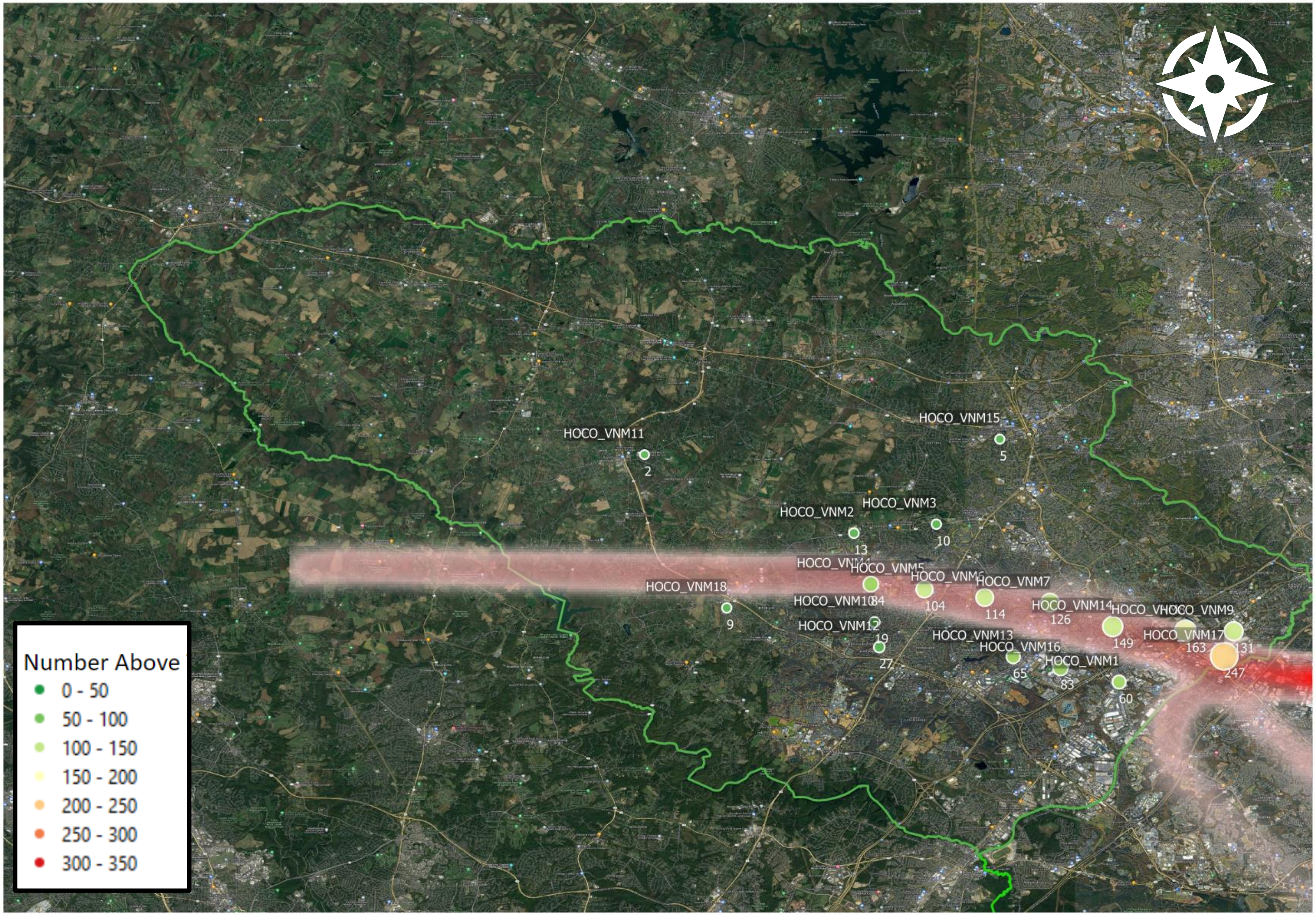
Flight Track Density Analysis – Departures (with NA55)

Howard County


HOCO_VNM11
16
HOCO_VNM15
18
HOCO_VNM2
164
HOCO_VNM3
149
HOCO_VNM4
HOCO_VNM5
HOCO_VNM6
HOCO_VNM7
HOCO_VNM18
131
HOCO_VNM10
187
192
197
HOCO_VNM14
197
HOCO_V
HOCO_VNM9
HOCO_VNM12
190
165
HOCO_VNM13
HOCO_VNM16
229
HOCO_VNM1
236
201
HOCO_VNM17
249
254
348
305
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

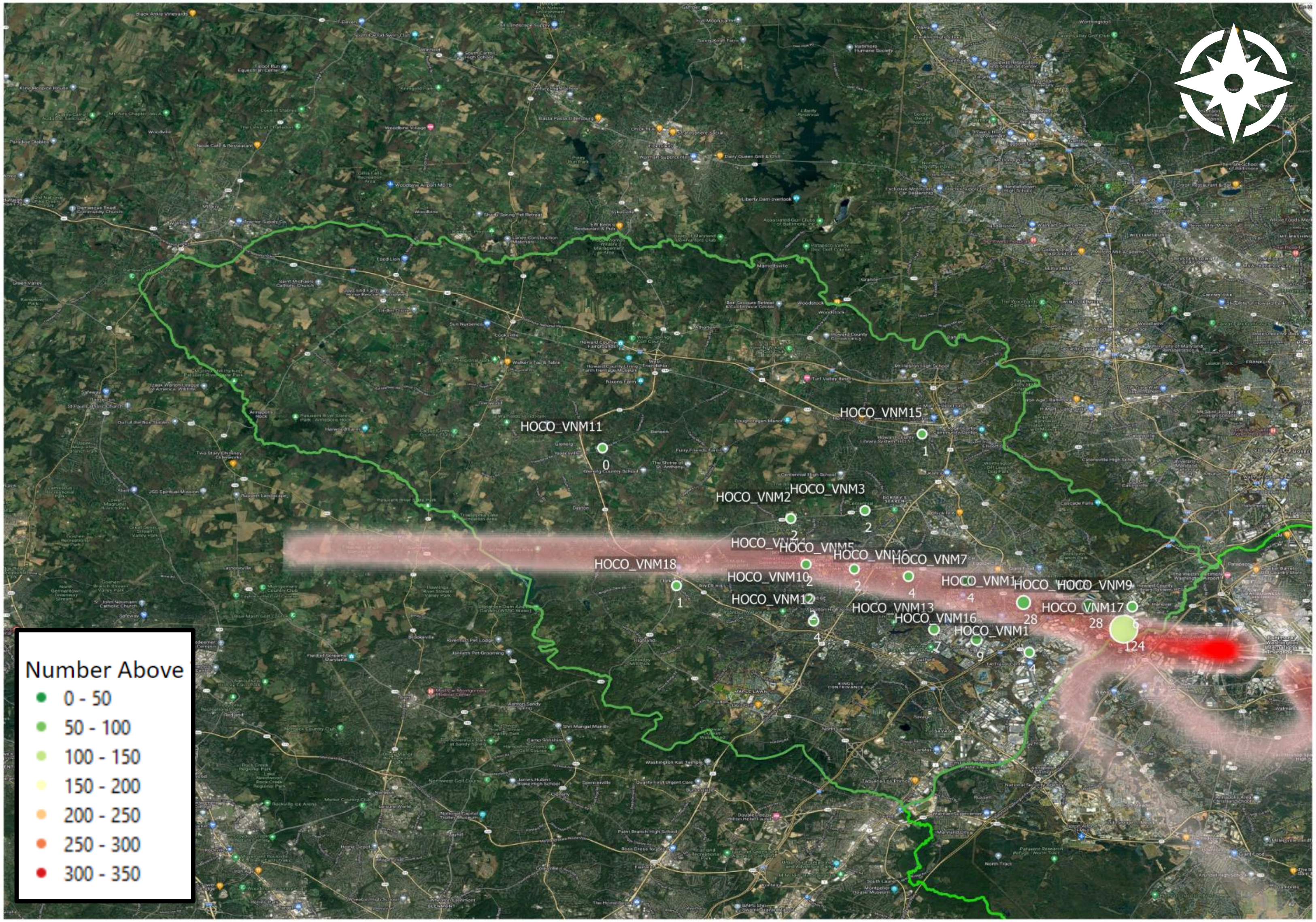
Flight Track Density Analysis – Departures (with NA65)

Howard County


HOCO_VNM11
2
HOCO_VNM15
5
HOCO_VNM2
13
HOCO_VNM3
10
HOCO_VNM4
HOCO_VNM5
HOCO_VNM6
HOCO_VNM7
HOCO_VNM18
9
HOCO_VNM10
84
104
114
HOCO_VNM14
126
HOCO_V
HOCO_VNM9
HOCO_VNM12
19
27
HOCO_VNM13
HOCO_VNM16
65
HOCO_VNM1
83
60
149
HOCO_VNM17
163
131
247
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

Flight Track Density Analysis – Departures (with NA75)

Howard County


HOCO_VNM11
0
HOCO_VNM15
1
HOCO_VNM2
2
HOCO_VNM3
2
HOCO_VNM4
HOCO_VNM5
HOCO_VNM6
HOCO_VNM7
HOCO_VNM18
1
HOCO_VNM10
2
2
4
HOCO_VNM14
4
HOCO_
HOCO_VNM9
HOCO_VNM12
4
HOCO_VNM13
HOCO_VNM16
7
HOCO_VNM1
9
4
HOCO_VNM17
28
28
6
124
Number Above
🟢 0 - 50
🟢 50 - 100
🟢 100 - 150
🟡 150 - 200
🟠 200 - 250
🟠 250 - 300
🔴 300 - 350

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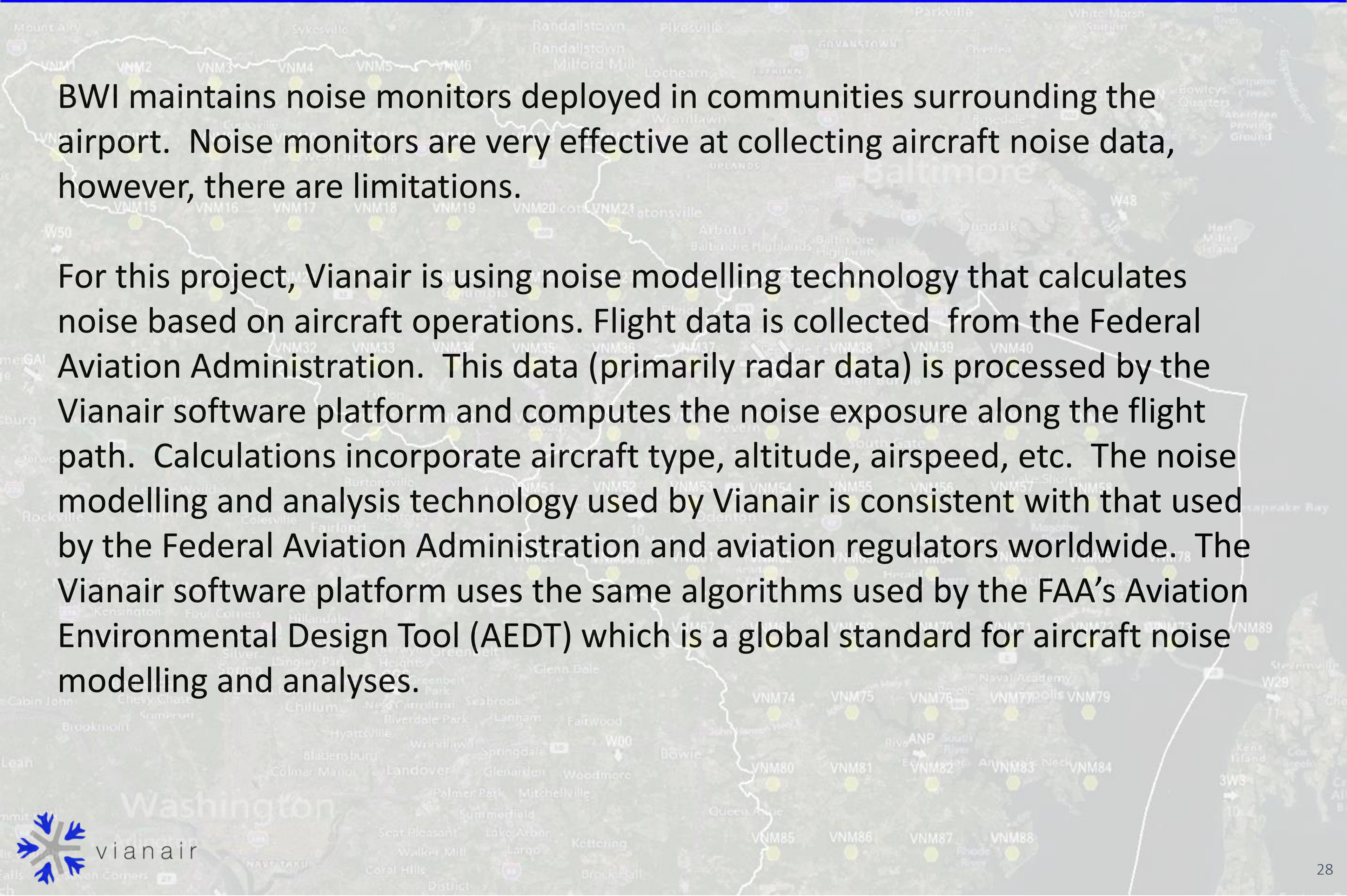
NOISE EXPOSURE

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.

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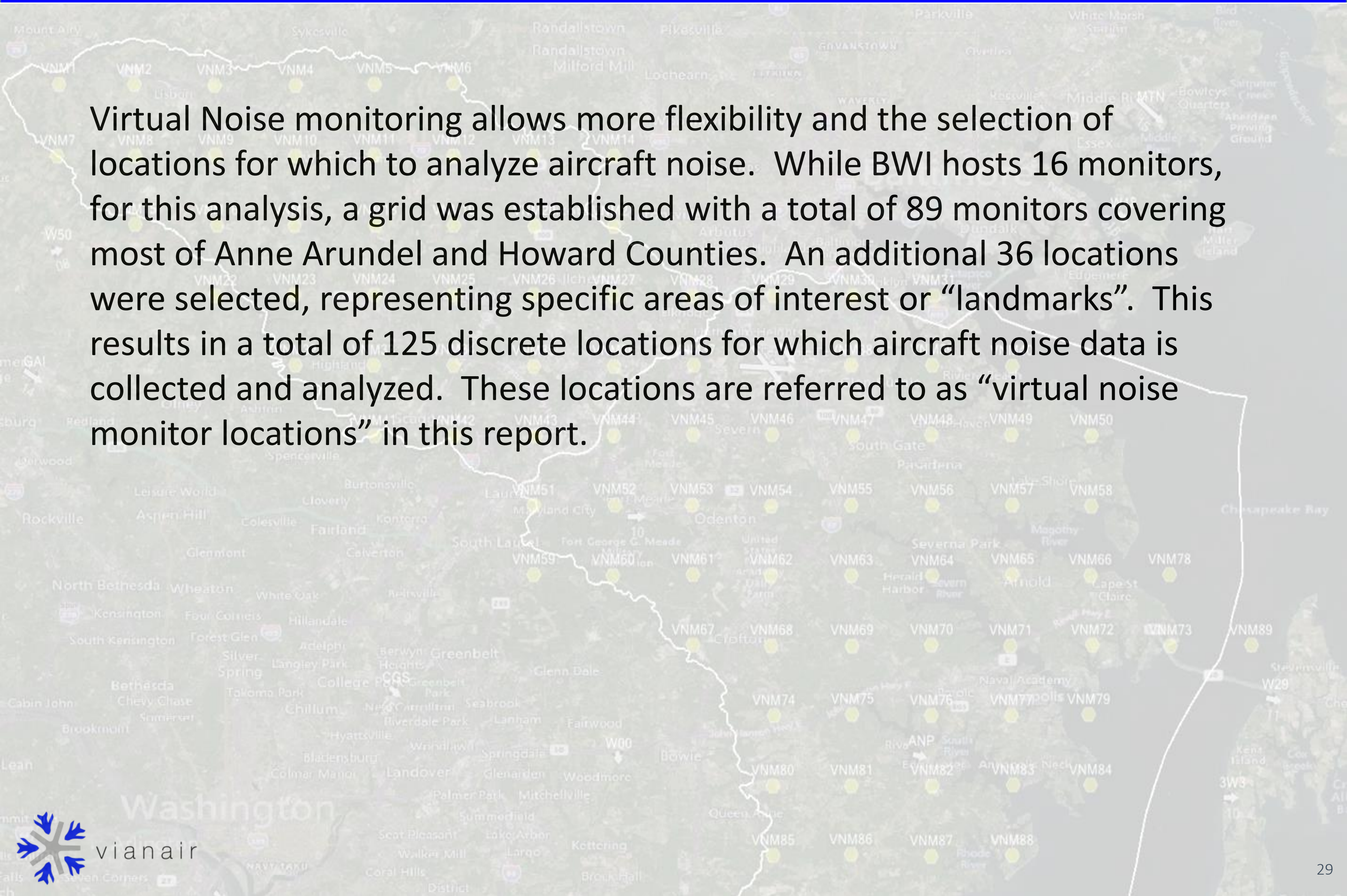
Noise Analysis - Overview


VNM1
VNM2
VNM3
VNM4
VNM5
VNM6
VNM7
VNM8
VNM9
VNM10
VNM11
VNM12
VNM13
VNM14
W50
VNM22
VNM23
VNM24
VNM25
VNM26
VNM27
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VNM29
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VNM31
GAI
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VNM45
VNM46
VNM47
VNM48
VNM49
VNM50
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VNM65
VNM66
VNM78
VNM67
VNM68
VNM69
VNM70
VNM71
VNM72
VNM73
VNM89
CGS
VNM74
VNM75
VNM76
VNM77
VNM79
W29
W00
ANP
VNM80
VNM81
VNM82
VNM83
VNM84
3W3
VNM85
VNM86
VNM87
VNM88
Washington

Virtual 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.

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).

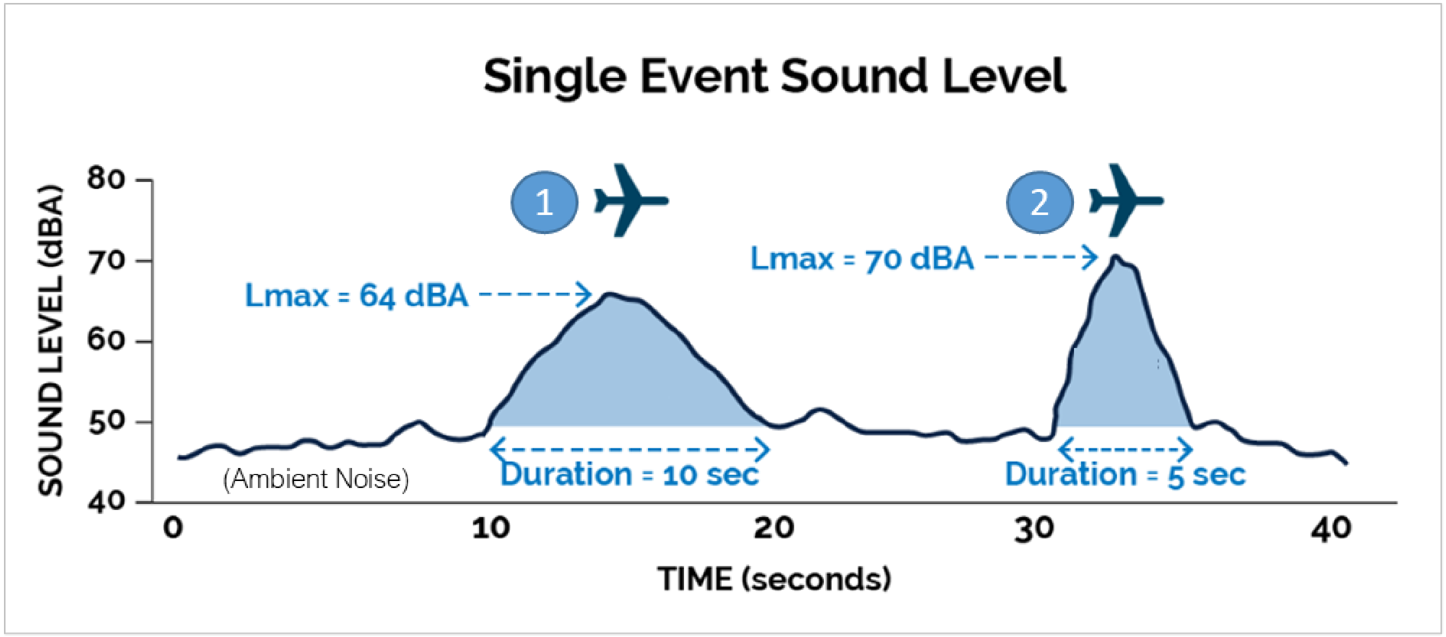
DNL is the standard metric used by the Federal Aviation Administration as required by federal regulation. The problem with DNL is it is difficult to understand and doesn’t seem to reflect what residents experience on a daily basis.

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).

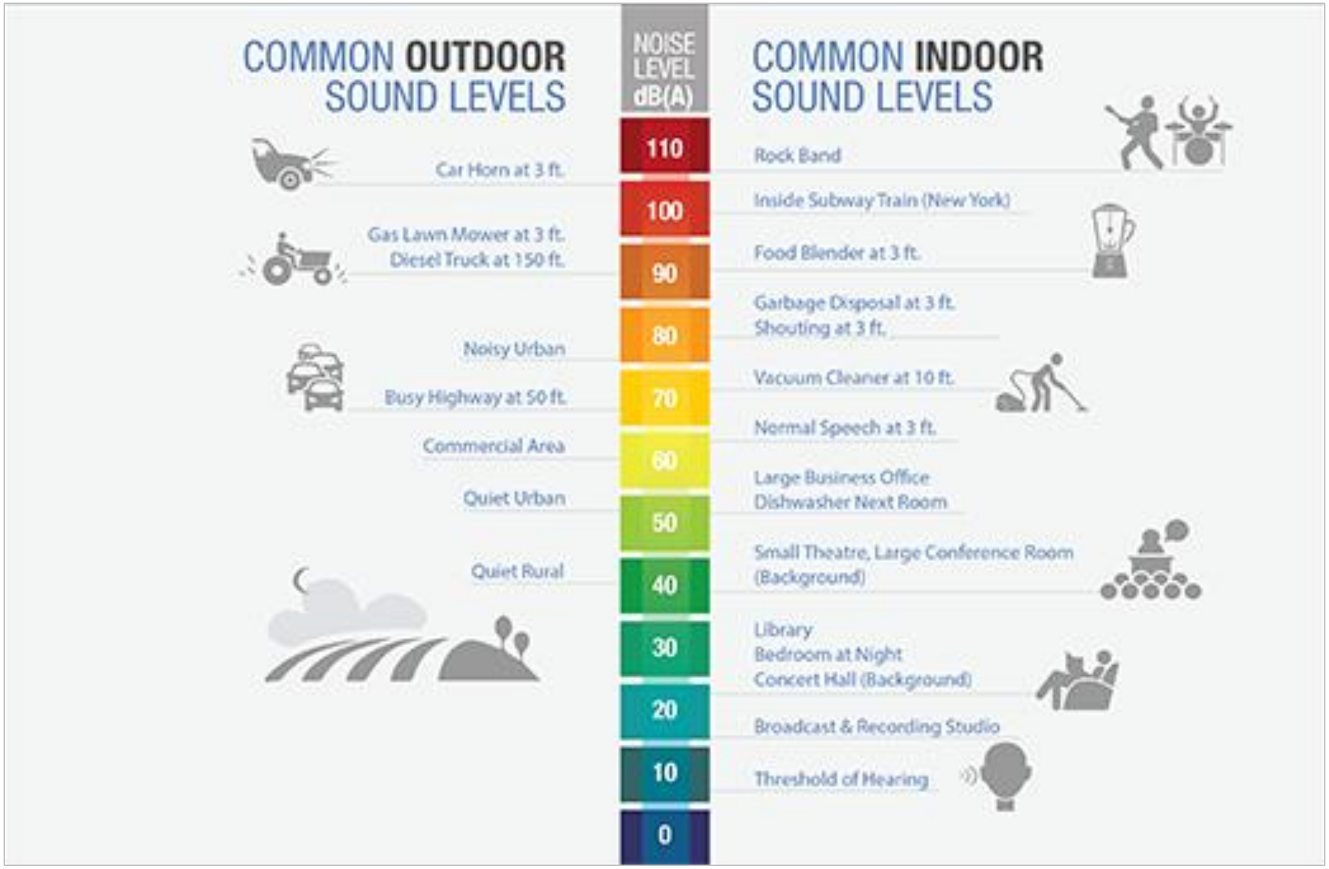
The NA noise metric counts the number of times the noise level exceeds a specific threshold. In this report, 55, 65, and 75 decibels was selected.



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

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

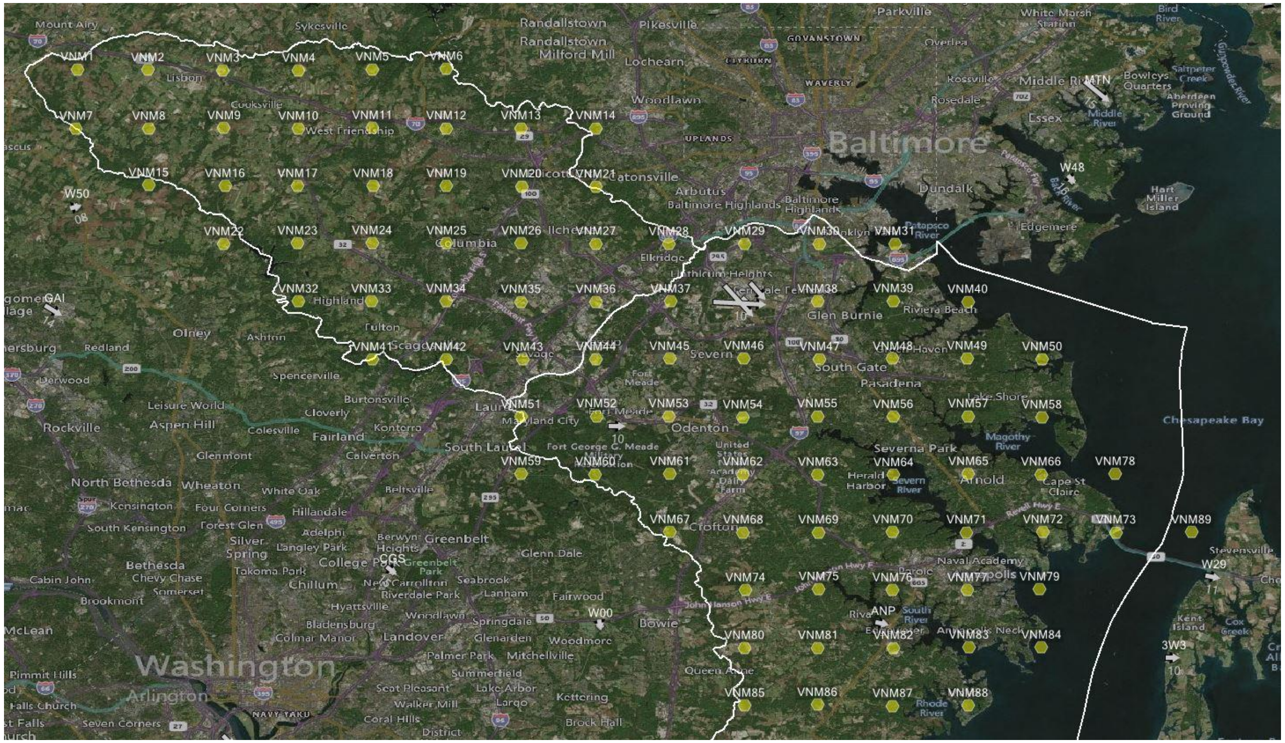
NOISE EXPOSURE

Virtual Noise Analysis – Monthly Data

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.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VNM83
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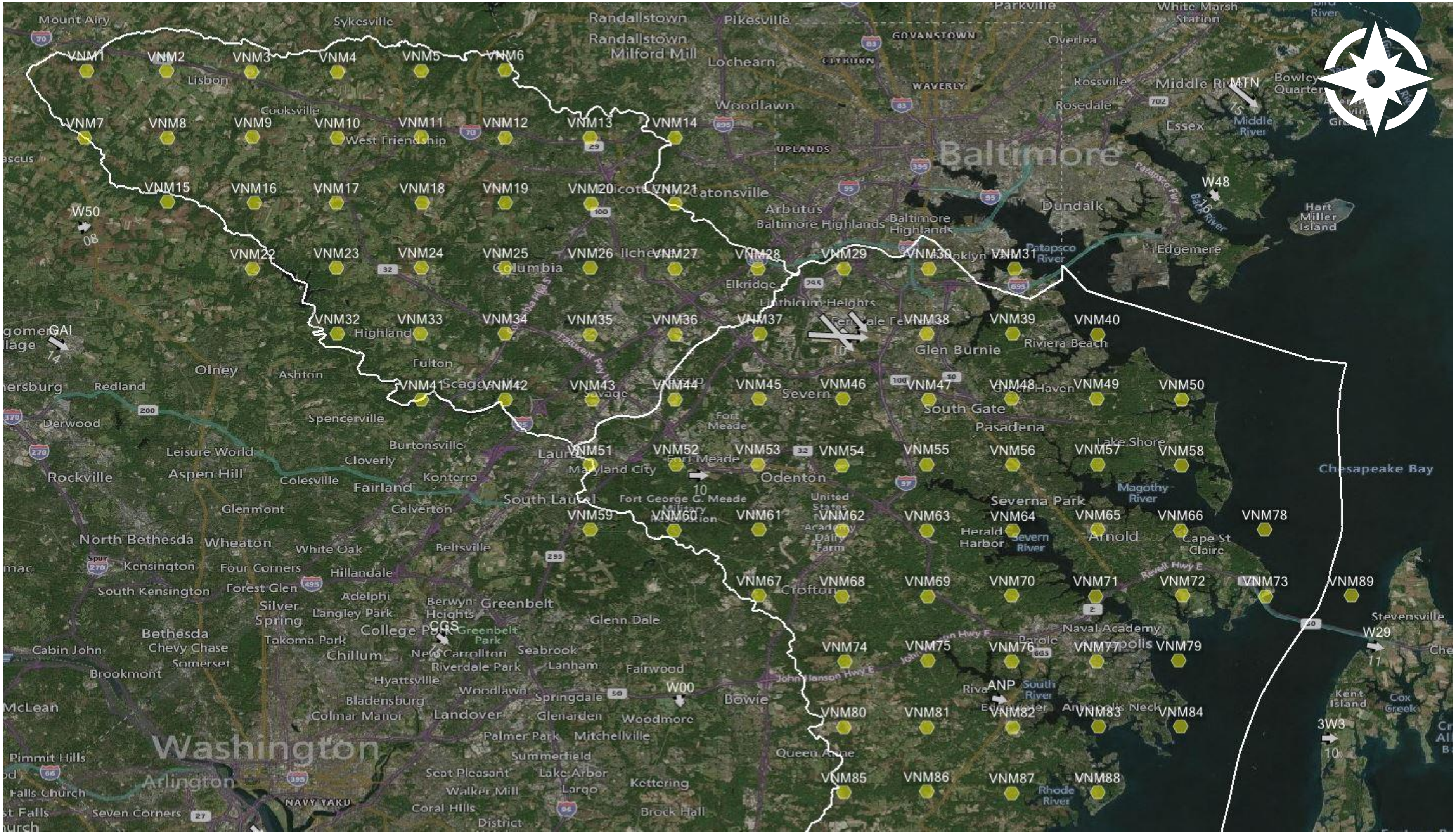
MTN
W48
Baltimore
Washington
Chesapeake Bay

Noise Exposure – Virtual Noise Monitor Locations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Randallstown
Randallstown
Milford Mill
Pikesville
Parkville
White Marsh
Station
GOVANSTOWN
Overlea
Lochearn
WAVERLY
Rossville
Middle River
MTN
Bowley
Quarters
VNM1
VNM2
VNM3
VNM4
VNM5
VNM6
Lisbon
Cooksville
Woodlawn
Rosedale
Essex
Middle
River
VNM7
VNM8
VNM9
VNM10
VNM11
VNM12
VNM13
VNM14
West Friendship
UPLANDS
Baltimore
VNM15
VNM16
VNM17
VNM18
VNM19
VNM20
VNM21
Catonsville
Arbutus
Baltimore Highlands
Baltimore
Highlands
Dundalk
W48
Hart
Miller
Island
W50
08
VNM22
VNM23
VNM24
VNM25
Columbia
VNM26
VNM27
VNM28
VNM29
VNM30
VNM31
Patapsco
River
Edgemere
Elkridge
Linthicum Heights
GAI
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VNM32
Highland
VNM33
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VNM39
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Glen Burnie
Riviera Beach
10
Olney
Ashton
Fulton
Redland
VNM41
VNM42
VNM43
Savage
VNM44
VNM45
Severn
VNM46
VNM47
VNM48
VNM49
VNM50
South Gate
Pasadena
Derwood
Spencerville
Fort
Meade
Burtonsville
Leisure World
Cloverly
Laurel
VNM51
VNM52
Fort Meade
VNM53
VNM54
VNM55
VNM56
VNM57
Lake Shore
VNM58
Chesapeake Bay
Rockville
Aspen Hill
Colesville
Fairland
Konterra
Maryland City
Odenton
Magothy
River
10
South Laurel
Fort George G. Meade
Military
Reservation
United
States
Naval
Academy
Dairy
Farm
Severna Park
Glenmont
Calverton
VNM59
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VNM61
VNM62
VNM63
VNM64
VNM65
VNM66
VNM78
Herald
Harbor
Severn
River
Arnold
Cape St
Claire
North Bethesda
Wheaton
White Oak
Beltsville
Kensington
Four Corners
Hillandale
South Kensington
Forest Glen
VNM67
Crofton
VNM68
VNM69
VNM70
VNM71
VNM72
VNM73
VNM89
Adelphi
Silver
Spring
Langley Park
Berwyn
Heights
Greenbelt
Glenn Dale
Stevensville
W29
Bethesda
Chevy Chase
Takoma Park
College Park
CGS
Greenbelt
Park
Naval Academy
Annapolis
VNM79
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Cabin John
Somerset
Chillum
New Carrollton
Seabrook
VNM74
VNM75
VNM76
Parole
VNM77
Brookmont
Riverdale Park
Lanham
Fairwood
Hyattsville
ANP
South
River
Kent
Island
Cox
Creek
McLean
Bladensburg
Woodlawn
Springdale
W00
Bowie
Riva
Colmar Manor
Landover
Glenarden
Woodmore
VNM80
VNM81
Edgewater
VNM82
Annapolis Neck
VNM83
VNM84
3W3
10
Washington
Palmer Park
Mitchellville
Queen Anne
Pimmit Hills
Summerfield
Arlington
Seat Pleasant
Lake Arbor
Kettering
VNM85
VNM86
VNM87
VNM88
Rhode
River
Falls Church
NAVY YARD
Walker Mill
Largo
Seven Corners
Coral Hills
Brock Hall
District

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Noise Exposure – Virtual Noise Monitor Locations

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

ID	Latitude	Longitude	Elevation
VNM1	39.342462	-77.149704	879
VNM2	39.342017	-77.098984	784
VNM3	39.341572	-77.044704	680
VNM4	39.341572	-76.98998	583
VNM5	39.342462	-76.937035	629
VNM6	39.342907	-76.883645	652
VNM7	39.29975	-77.150594	759
VNM8	39.29975	-77.098094	520
VNM9	39.300127	-77.04389	680
VNM10	39.29975	-76.990272	583
VNM11	39.300315	-76.937031	629
VNM12	39.300051	-76.883621	629
VNM13	39.300051	-76.829825	408
VNM14	39.300051	-76.775888	538
VNM15	39.258958	-77.098251	520
VNM16	39.258421	-77.043211	500
VNM17	39.258421	-76.990856	564
VNM18	39.258421	-76.936353	443
VNM19	39.258421	-76.883461	448
VNM20	39.258152	-76.829227	415

ID	Latitude	Longitude	Elevation
VNM21	39.257884	-76.775798	309
VNM22	39.216537	-77.044017	500
VNM23	39.217074	-76.990856	596
VNM24	39.217342	-76.937159	596
VNM25	39.217074	-76.883461	399
VNM26	39.217074	-76.829495	515
VNM27	39.216805	-76.775798	458
VNM28	39.216537	-76.723174	177
VNM29	39.216805	-76.668403	32
VNM30	39.216805	-76.614437	142
VNM31	39.216805	-76.560203	28
VNM32	39.17519	-76.990319	527
VNM33	39.17519	-76.937696	400
VNM34	39.175458	-76.88373	369
VNM35	39.174921	-76.829764	320
VNM36	39.174921	-76.775798	220
VNM37	39.17519	-76.721832	144
VNM38	39.17519	-76.61578	26
VNM39	39.175458	-76.561277	68
VNM40	39.174921	-76.507579	13

ID	Latitude	Longitude	Elevation
VNM41	39.133306	-76.936622	442
VNM42	39.133306	-76.88373	303
VNM43	39.133306	-76.828153	247
VNM44	39.133574	-76.775529	237
VNM45	39.133843	-76.722637	166
VNM46	39.134111	-76.66894	137
VNM47	39.133574	-76.614437	60
VNM48	39.133843	-76.561545	45
VNM49	39.134111	-76.508116	120
VNM50	39.133574	-76.453882	24
VNM51	39.091959	-76.829764	113
VNM52	39.092496	-76.775261	117
VNM53	39.092496	-76.723174	181
VNM54	39.09169	-76.669745	193
VNM55	39.092496	-76.616048	101
VNM56	39.091959	-76.561277	37
VNM57	39.092496	-76.507311	70
VNM58	39.09169	-76.45415	24
VNM59	39.05088	-76.829764	118
VNM60	39.050612	-76.776066	152

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

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Noise Exposure – Virtual Noise Monitor Locations

(Landmark Locations)

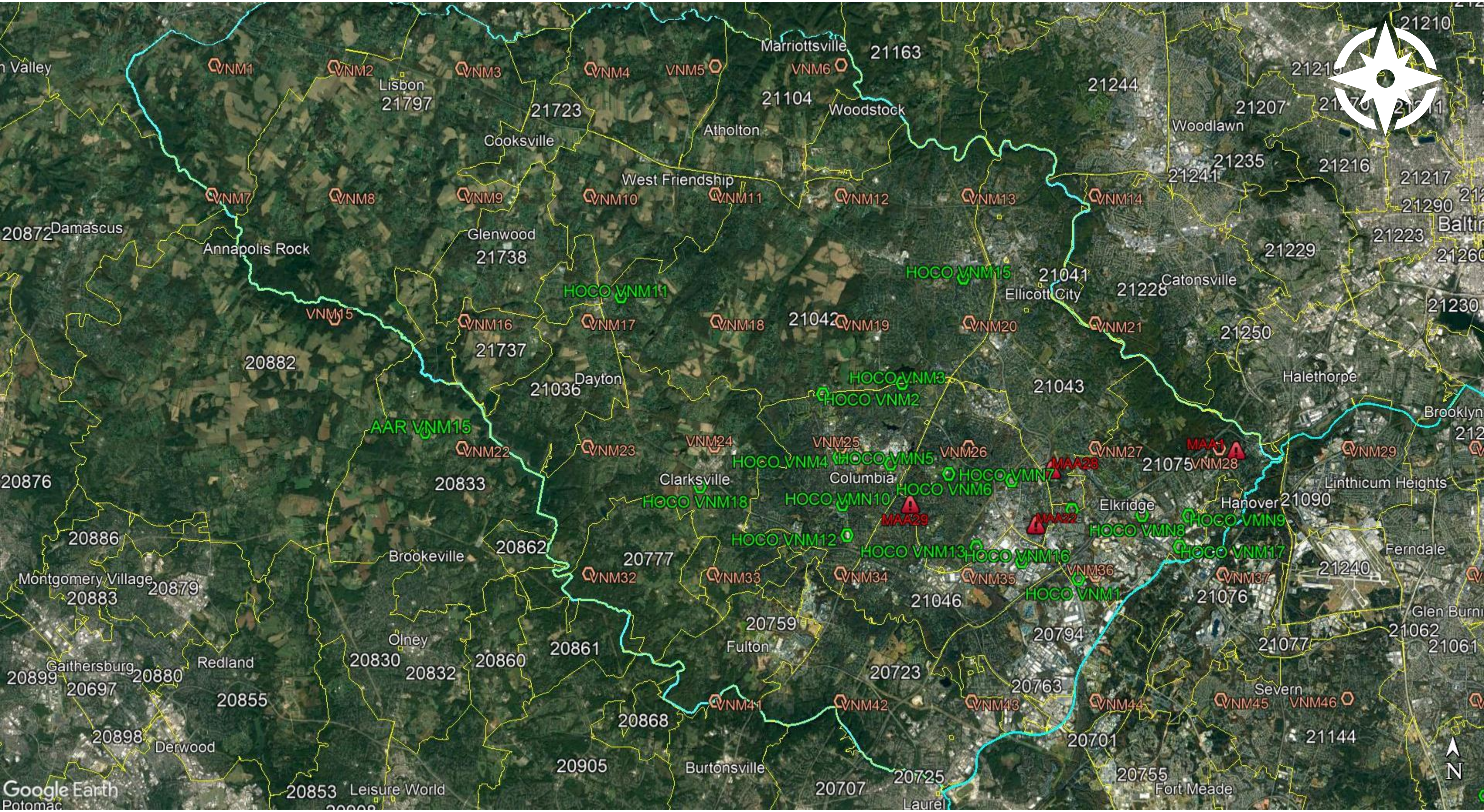
Howard County

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

Virtual Noise Monitor Locations – Howard County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Brookeville
Olney
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Leisure World
Damascus
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Annapolis Rock
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Montgomery Village
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Gaithersburg
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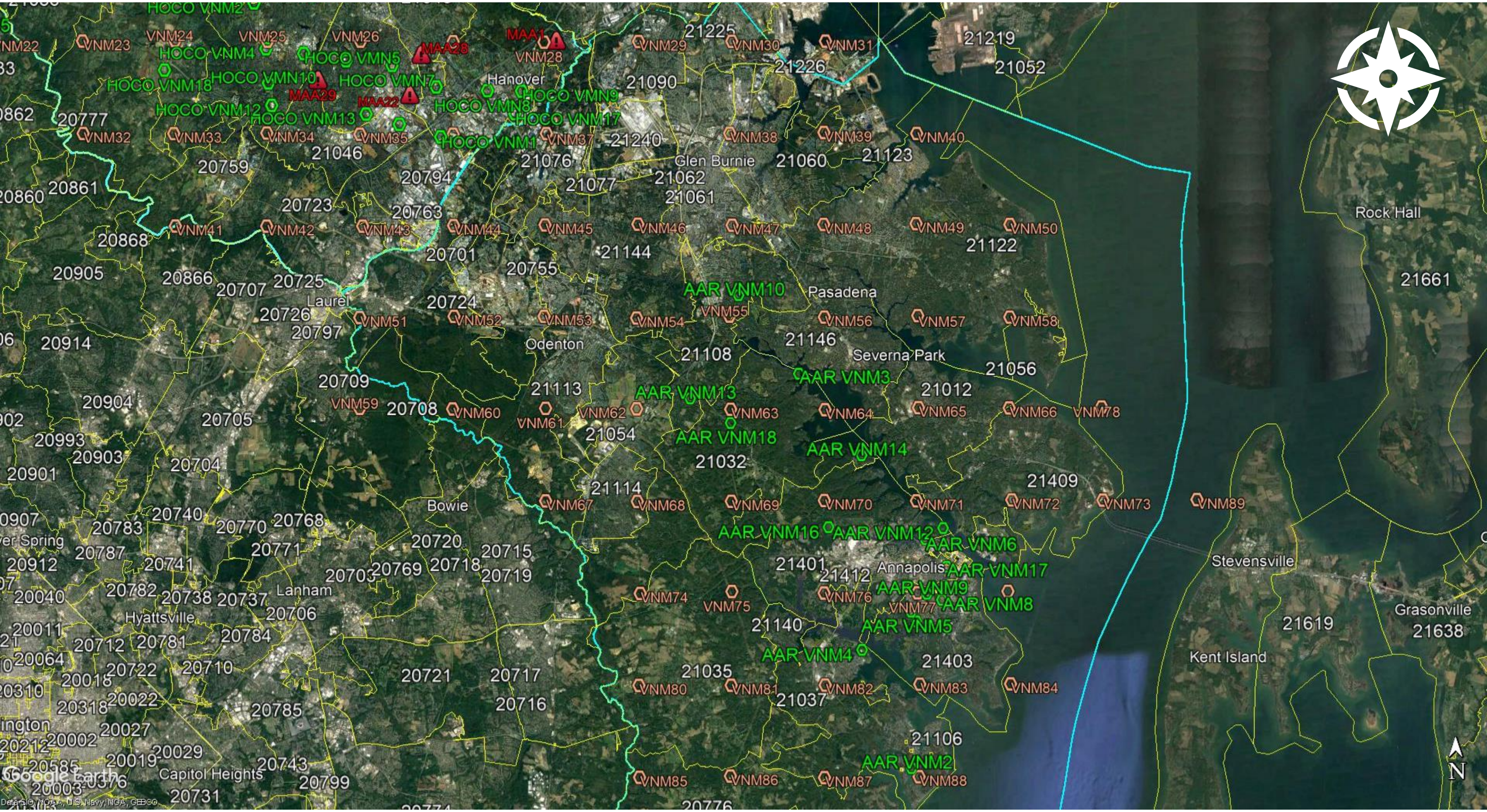
Virtual Noise Monitor Locations – Anne Arundel County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HOCO VNM18
HOCO VMN10
HOCO VMN7
MAA29
MAA22
Hanover
HOCO VMN9
HOCO VNM12
HOCO VNM13
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HOCO VNM1
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Laurel
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AAR VNM10
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Odenton
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Severna Park
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VNM59
20708
VNM60
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VNM62
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VNM71
VNM72
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Bowie
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20783
20770
20768
Silver Spring
20787
20771
20720
AAR VNM16
AAR VNM12
AAR VNM6
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20912
20741
20703
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21401
21412
Annapolis
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Stevensville
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Lanham
VNM74
VNM75
VNM76
AAR VNM9
VNM77
AAR VNM8
Hyattsville
20706
21140
AAR VNM5
21619
Grasonville
21638
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20712
20781
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20064
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20710
AAR VNM4
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Kent Island
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VNM81
21037
VNM82
VNM83
VNM84
Washington
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20002
21106
20212
20029
20019
20743
AAR VNM2
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Capitol Heights
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Google Earth
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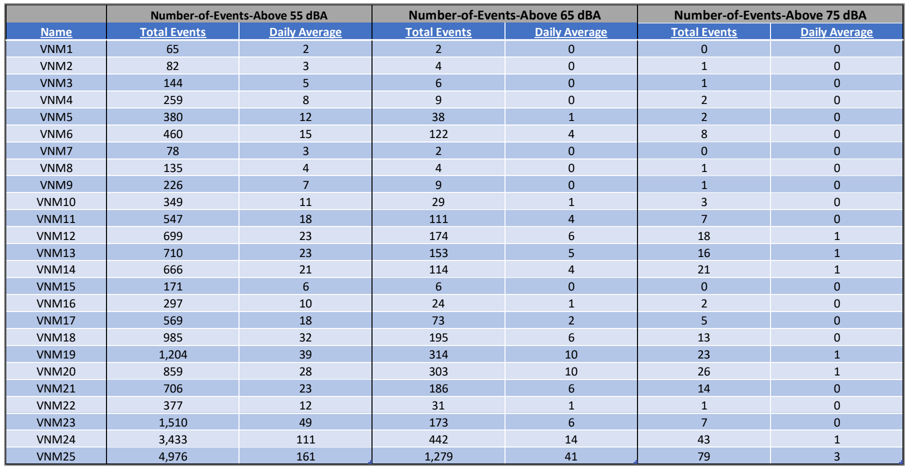
Noise Event Data

Number-of-Events-Above

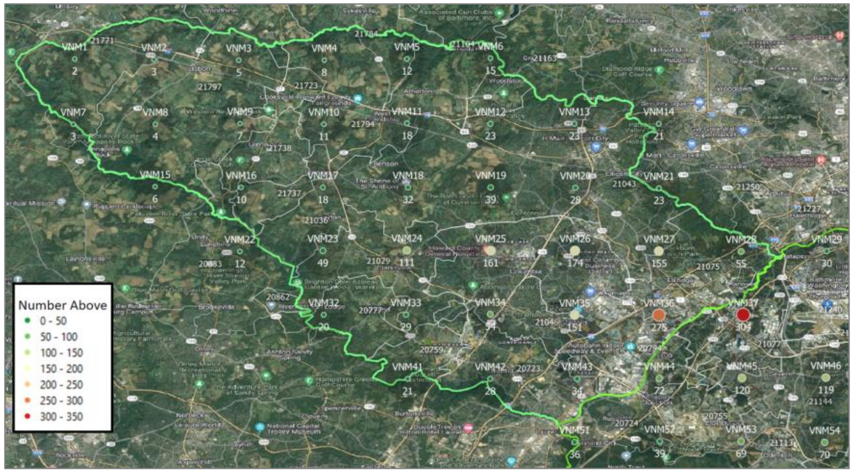
The following slides include aircraft noise exposure levels at each of the 125 locations based on the Number-of-Events-Above metric (NA), and thresholds of 55 decibels, 65 decibels, and 75 decibels. The tables include both a total count for the reporting period (month) as well as the daily average for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



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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	43	1	8	0	2	0
VNM2	59	2	11	0	1	0
VNM3	94	3	18	1	2	0
VNM4	120	4	28	1	1	0
VNM5	144	5	36	1	1	0
VNM6	242	8	56	2	3	0
VNM7	52	2	8	0	1	0
VNM8	84	3	17	1	2	0
VNM9	109	4	29	1	2	0
VNM10	150	5	37	1	1	0
VNM11	232	8	50	2	1	0
VNM12	452	15	97	3	6	0
VNM13	424	14	93	3	11	0
VNM14	361	12	124	4	18	1
VNM15	103	3	24	1	2	0
VNM16	128	4	40	1	2	0
VNM17	385	13	60	2	6	0
VNM18	717	24	110	4	16	1
VNM19	975	33	187	6	21	1
VNM20	433	14	128	4	27	1
VNM21	238	8	98	3	32	1
VNM22	172	6	40	1	2	0
VNM23	2,656	89	135	5	8	0
VNM24	4,380	146	359	12	28	1
VNM25	5,399	180	2,151	72	43	1

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	5,419	181	1,499	50	57	2
VNM27	4,529	151	267	9	53	2
VNM28	1,178	39	244	8	52	2
VNM29	737	25	220	7	38	1
VNM30	336	11	125	4	25	1
VNM31	409	14	113	4	17	1
VNM32	320	11	71	2	11	0
VNM33	696	23	147	5	26	1
VNM34	1,877	63	515	17	62	2
VNM35	5,195	173	767	26	81	3
VNM36	9,328	311	4,705	157	185	6
VNM37	10,249	342	9,067	302	7,731	258
VNM38	749	25	358	12	73	2
VNM39	572	19	164	5	43	1
VNM40	891	30	183	6	25	1
VNM41	399	13	143	5	23	1
VNM42	659	22	247	8	51	2
VNM43	625	21	273	9	50	2
VNM44	1,843	61	795	27	61	2
VNM45	3,656	122	1,424	47	74	2
VNM46	3,554	118	2,078	69	1,297	43
VNM47	5,131	171	1,451	48	243	8
VNM48	1,118	37	348	12	77	3
VNM49	2,254	75	507	17	63	2
VNM50	984	33	166	6	28	1

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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	950	32	215	7	30	1
VNM52	468	16	151	5	29	1
VNM53	1,634	54	840	28	40	1
VNM54	1,733	58	234	8	68	2
VNM55	4,309	144	646	22	75	3
VNM56	2,524	84	780	26	94	3
VNM57	1,594	53	496	17	105	4
VNM58	1,104	37	247	8	35	1
VNM59	288	10	100	3	11	0
VNM60	1,642	55	231	8	15	1
VNM61	444	15	139	5	24	1
VNM62	1,231	41	225	8	57	2
VNM63	777	26	185	6	85	3
VNM64	4,301	143	978	33	111	4
VNM65	1,566	52	350	12	88	3
VNM66	702	23	205	7	41	1
VNM67	853	28	114	4	10	0
VNM68	1,450	48	163	5	28	1
VNM69	958	32	168	6	56	2
VNM70	1,999	67	449	15	80	3
VNM71	1,579	53	268	9	56	2
VNM72	688	23	157	5	29	1
VNM73	282	9	82	3	7	0
VNM74	665	22	98	3	10	0
VNM75	1,244	41	144	5	22	1

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
VNM76	1,692	56	176	6	32	1
VNM77	716	24	137	5	21	1
VNM78	428	14	104	3	11	0
VNM79	492	16	94	3	14	0
VNM80	265	9	48	2	5	0
VNM81	417	14	62	2	6	0
VNM82	301	10	66	2	6	0
VNM83	204	7	66	2	7	0
VNM84	196	7	59	2	4	0
VNM85	160	5	39	1	3	0
VNM86	169	6	41	1	4	0
VNM87	181	6	44	1	4	0
VNM88	177	6	45	2	5	0
VNM89	189	6	45	2	6	0

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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	103	3	18	1	3	0
AAR_VNM2	182	6	47	2	4	0
AAR_VNM3	5,121	171	3,449	115	248	8
AAR_VNM4	1,165	39	104	3	12	0
AAR_VNM5	650	22	112	4	15	1
AAR_VNM6	1,318	44	232	8	38	1
AAR_VNM7	56	2	14	0	1	0
AAR_VNM8	588	20	112	4	14	0
AAR_VNM9	709	24	133	4	18	1
AAR_VNM10	6,603	220	5,307	177	308	10
AAR_VNM11	510	17	98	3	12	0
AAR_VNM12	1,217	41	187	6	35	1
AAR_VNM13	1,113	37	170	6	95	3
AAR_VNM14	2,137	71	544	18	95	3
ARR_VNM15	126	4	38	1	4	0
AAR_VNM16	1,986	66	352	12	66	2
ARR_VNM17	1,022	34	163	5	24	1
ARR_VNM18	1,000	33	177	6	94	3

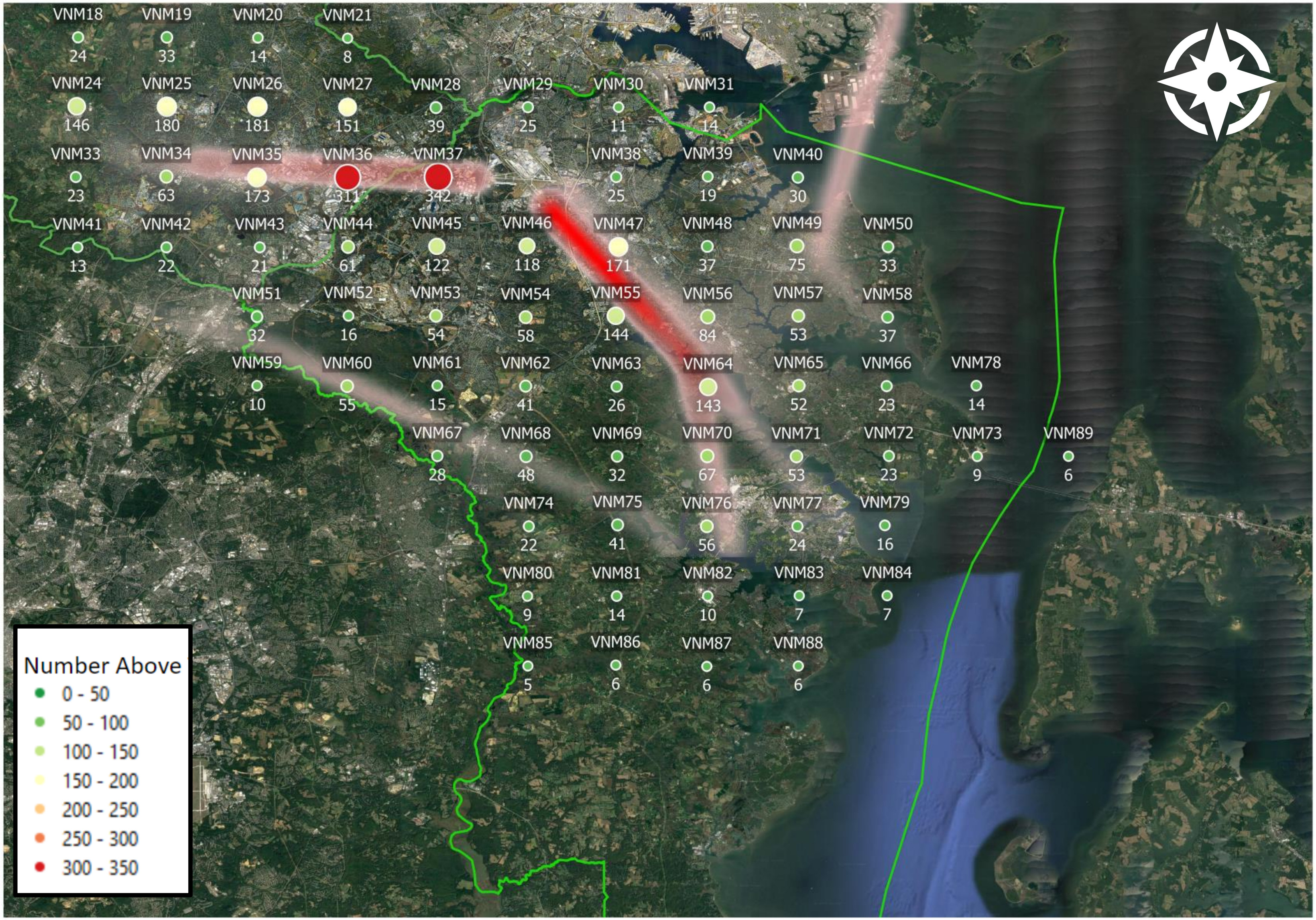
Noise Exposure: Number-of-Events-Above

(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	8,855	295	1,582	53	92	3
HOCO_VNM2	4,613	154	345	12	37	1
HOCO_VNM3	4,097	137	193	6	41	1
HOCO_VNM4	5,405	180	1,992	66	53	2
HOCO_VNM5	5,592	186	2,673	89	50	2
HOCO_VNM6	5,689	190	2,960	99	68	2
HOCO_VNM7	5,654	188	3,347	112	82	3
HOCO_VNM8	6,930	231	4,658	155	667	22
HOCO_VNM9	7,069	236	3,401	113	172	6
HOCO_VNM10	5,671	189	520	17	61	2
HOCO_VNM11	400	13	56	2	6	0
HOCO_VNM12	5,057	169	1,065	36	136	5
HOCO_VNM13	7,128	238	2,424	81	250	8
HOCO_VNM14	5,765	192	4,156	139	506	17
HOCO_VNM15	380	13	99	3	22	1
HOCO_VNM16	7,240	241	2,840	95	270	9
HOCO_VNM17	10,223	341	6,660	222	3,158	105
HOCO_VNM18	3,692	123	259	9	29	1

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

Anne Arundel County - Arrivals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VNM20 14
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VNM25 180
VNM26 181
VNM27 151
VNM28 39
VNM29 25
VNM30 11
VNM31 14
VNM33 23
VNM34 63
VNM35 173
VNM36 311
VNM37 342
VNM38 25
VNM39 19
VNM40 30
VNM41 13
VNM42 22
VNM43 21
VNM44 61
VNM45 122
VNM46 118
VNM47 171
VNM48 37
VNM49 75
VNM50 33
VNM51 32
VNM52 16
VNM53 54
VNM54 58
VNM55 144
VNM56 84
VNM57 53
VNM58 37
VNM59 10
VNM60 55
VNM61 15
VNM62 41
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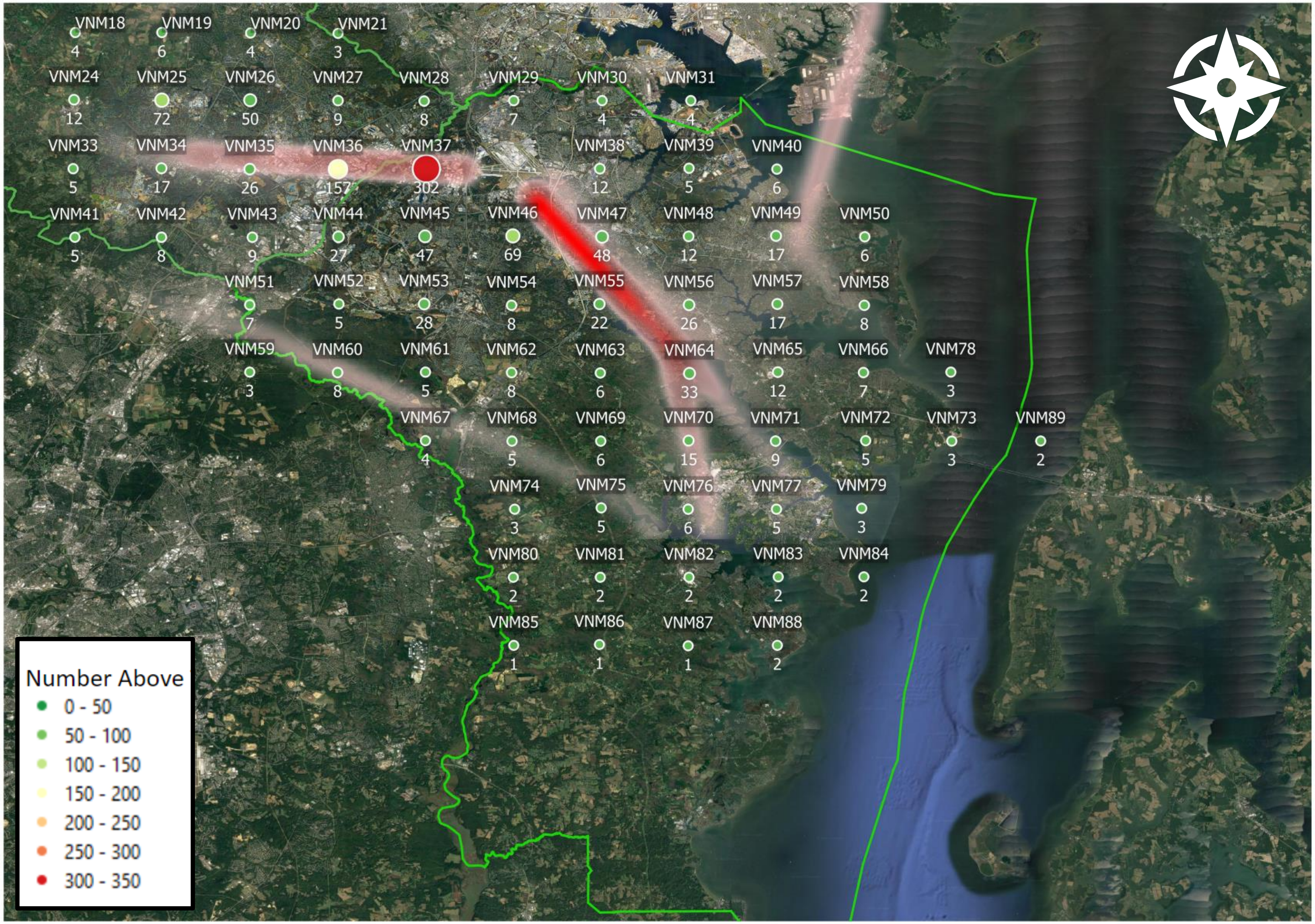
VNM64 143
VNM65 52
VNM66 23
VNM78 14
VNM67 28
VNM68 48
VNM69 32
VNM70 67
VNM71 53
VNM72 23
VNM73 9
VNM89 6
VNM74 22
VNM75 41
VNM76 56
VNM77 24
VNM79 16
VNM80 9
VNM81 14
VNM82 10
VNM83 7
VNM84 7
VNM85 5
VNM86 6
VNM87 6
VNM88 6
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

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

Anne Arundel County - Arrivals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VNM31 4
VNM33 5
VNM34 17
VNM35 26
VNM36 157
VNM37 302
VNM38 12
VNM39 5
VNM40 6
VNM41 5
VNM42 8
VNM43 9
VNM44 27
VNM45 47
VNM46 69
VNM47 48
VNM48 12
VNM49 17
VNM50 6
VNM51 7
VNM52 5
VNM53 28
VNM54 8
VNM55 22
VNM56 26
VNM57 17
VNM58 8
VNM59 3
VNM60 8
VNM61 5
VNM62 8
VNM63 6
VNM64 33
VNM65 12
VNM66 7
VNM78 3
VNM67 4
VNM68 5
VNM69 6
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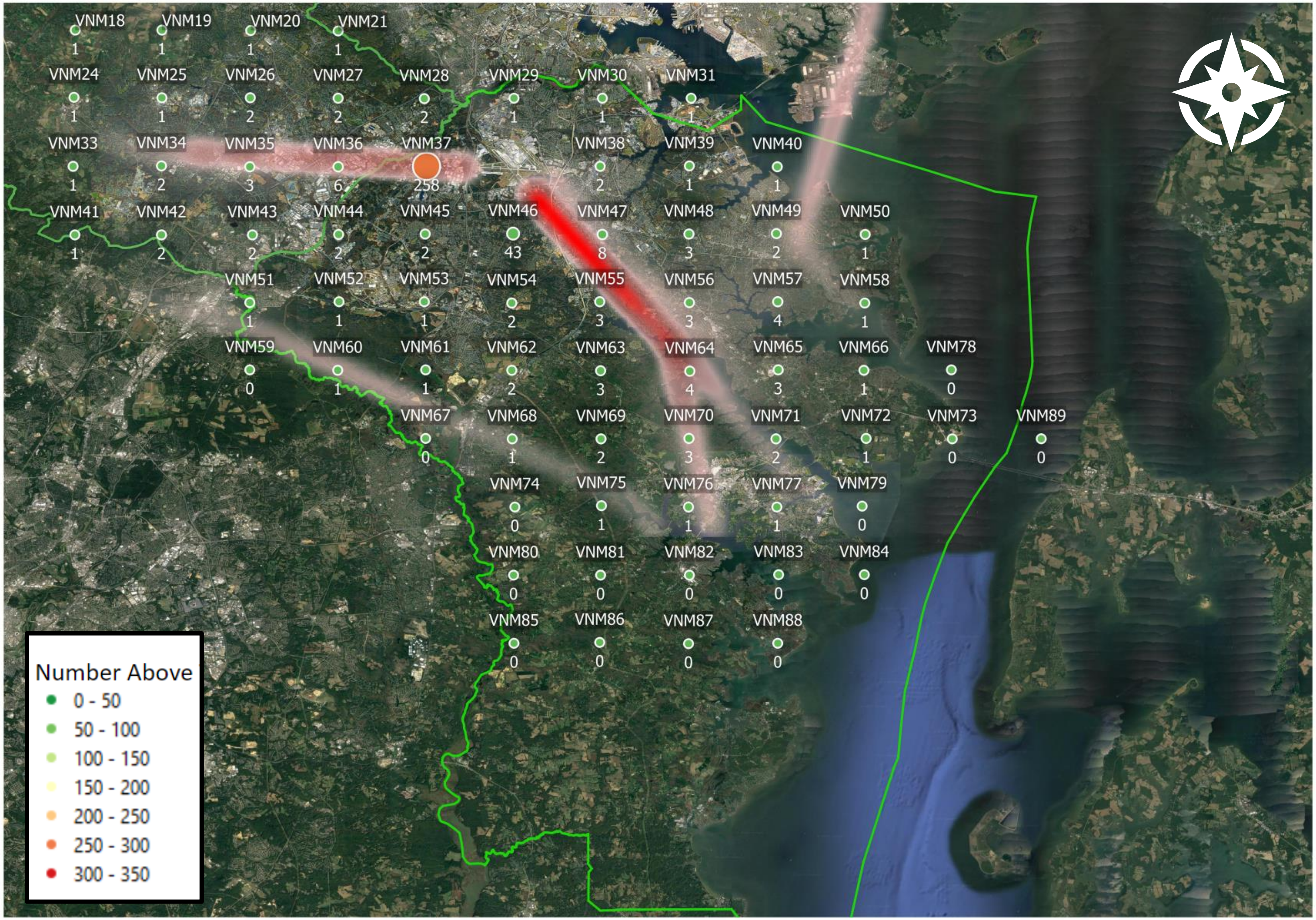
VNM75 5
VNM76 6
VNM77 5
VNM79 3
VNM80 2
VNM81 2
VNM82 2
VNM83 2
VNM84 2
VNM85 1
VNM86 1
VNM87 1
VNM88 2
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

vianair

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

Anne Arundel County - Arrivals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VNM31 1
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VNM36 6
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VNM42 2
VNM43 2
VNM44 2
VNM45 2
VNM46 43
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VNM48 3
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VNM51 1
VNM52 1
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VNM54 2
VNM55 3
VNM56 3
VNM57 4
VNM58 1
VNM59 0
VNM60 1
VNM61 1
VNM62 2
VNM63 3
VNM64 4
VNM65 3
VNM66 1
VNM78 0
VNM67 0
VNM68 1
VNM69 2
VNM70 3
VNM71 2
VNM72 1
VNM73 0
VNM89 0
VNM74 0
VNM75 1
VNM76 1
VNM77 1
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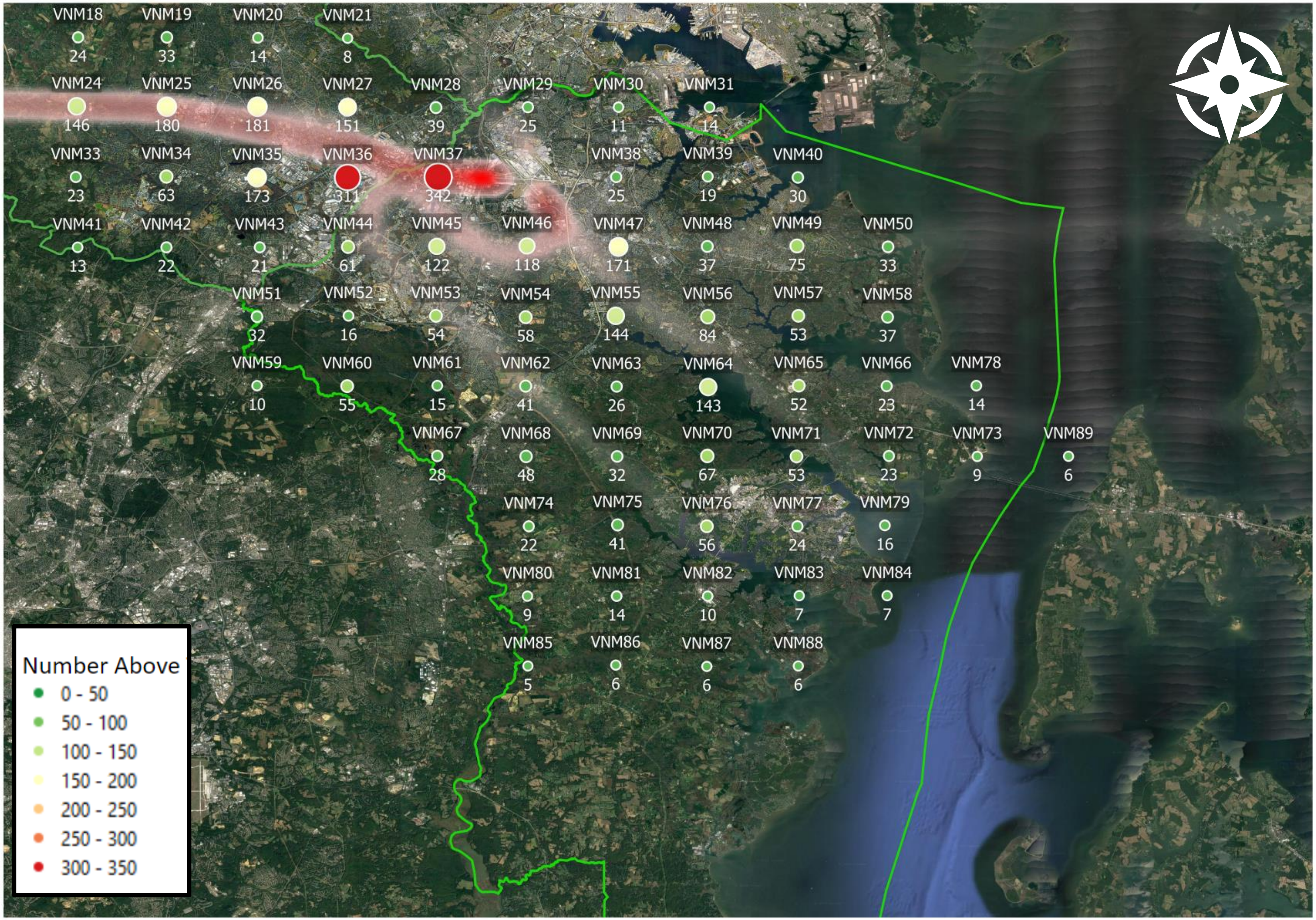
VNM84 0
VNM85 0
VNM86 0
VNM87 0
VNM88 0
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

vianair

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

Anne Arundel County - Departures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VNM26 181
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VNM29 25
VNM30 11
VNM31 14
VNM33 23
VNM34 63
VNM35 173
VNM36 311
VNM37 342
VNM38 25
VNM39 19
VNM40 30
VNM41 13
VNM42 22
VNM43 21
VNM44 61
VNM45 122
VNM46 118
VNM47 171
VNM48 37
VNM49 75
VNM50 33
VNM51 32
VNM52 16
VNM53 54
VNM54 58
VNM55 144
VNM56 84
VNM57 53
VNM58 37
VNM59 10
VNM60 55
VNM61 15
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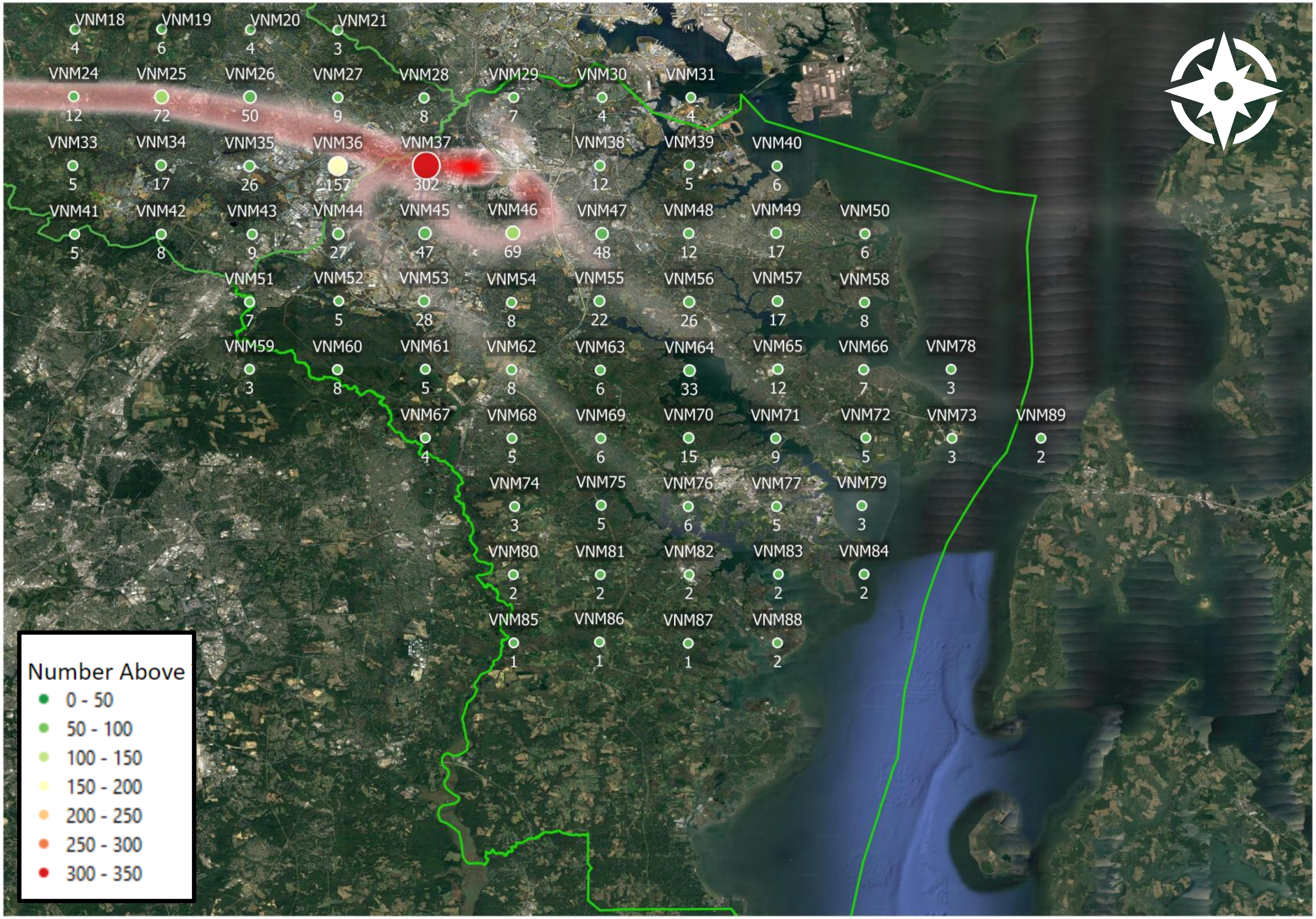
VNM66 23
VNM78 14
VNM67 28
VNM68 48
VNM69 32
VNM70 67
VNM71 53
VNM72 23
VNM73 9
VNM89 6
VNM74 22
VNM75 41
VNM76 56
VNM77 24
VNM79 16
VNM80 9
VNM81 14
VNM82 10
VNM83 7
VNM84 7
VNM85 5
VNM86 6
VNM87 6
VNM88 6
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

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

Anne Arundel County - Departures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VNM31 4
VNM33 5
VNM34 17
VNM35 26
VNM36 157
VNM37 302
VNM38 12
VNM39 5
VNM40 6
VNM41 5
VNM42 8
VNM43 9
VNM44 27
VNM45 47
VNM46 69
VNM47 48
VNM48 12
VNM49 17
VNM50 6
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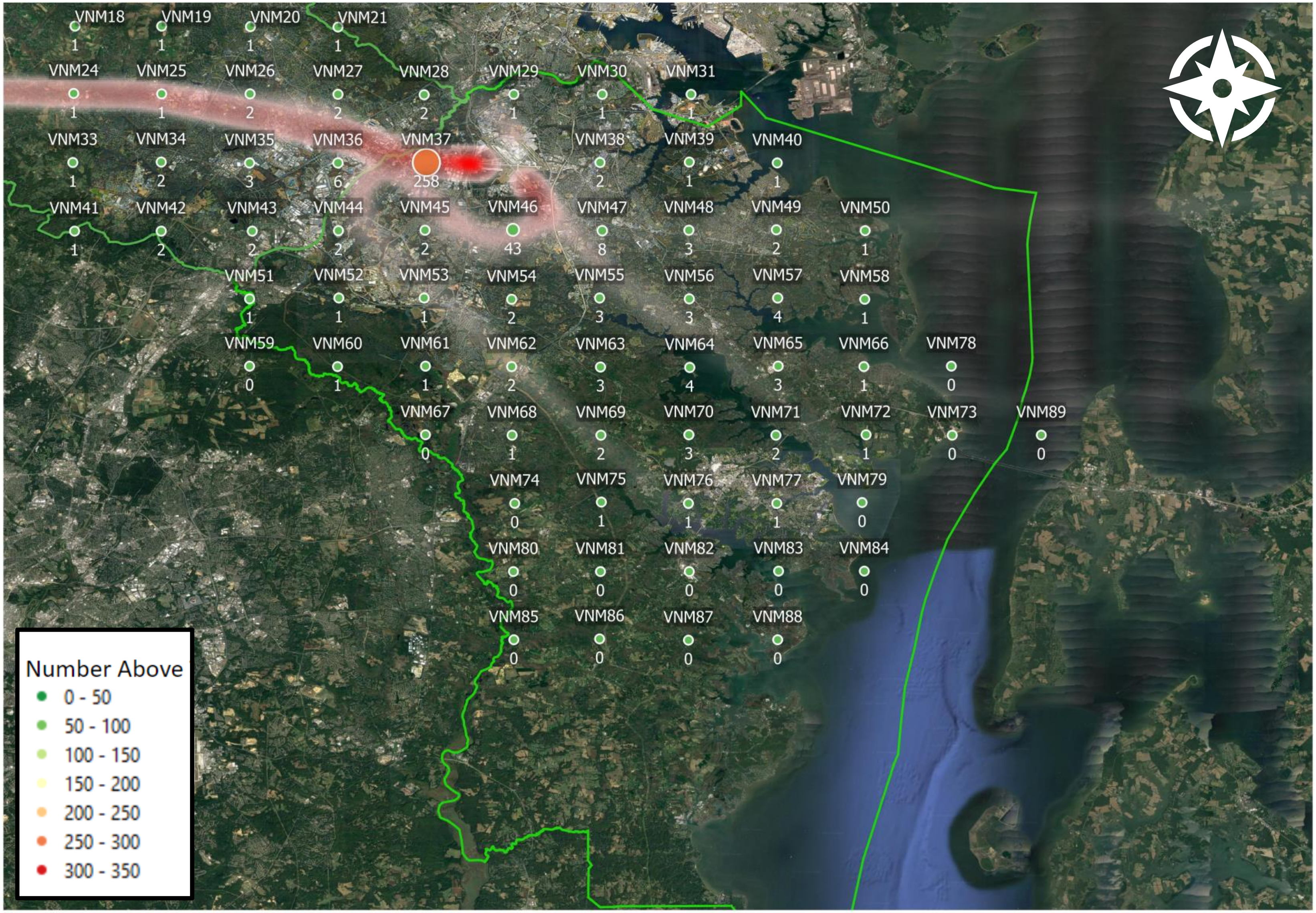
VNM79 3
VNM80 2
VNM81 2
VNM82 2
VNM83 2
VNM84 2
VNM85 1
VNM86 1
VNM87 1
VNM88 2
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

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

Anne Arundel County - Departures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VNM82
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VNM83
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VNM84
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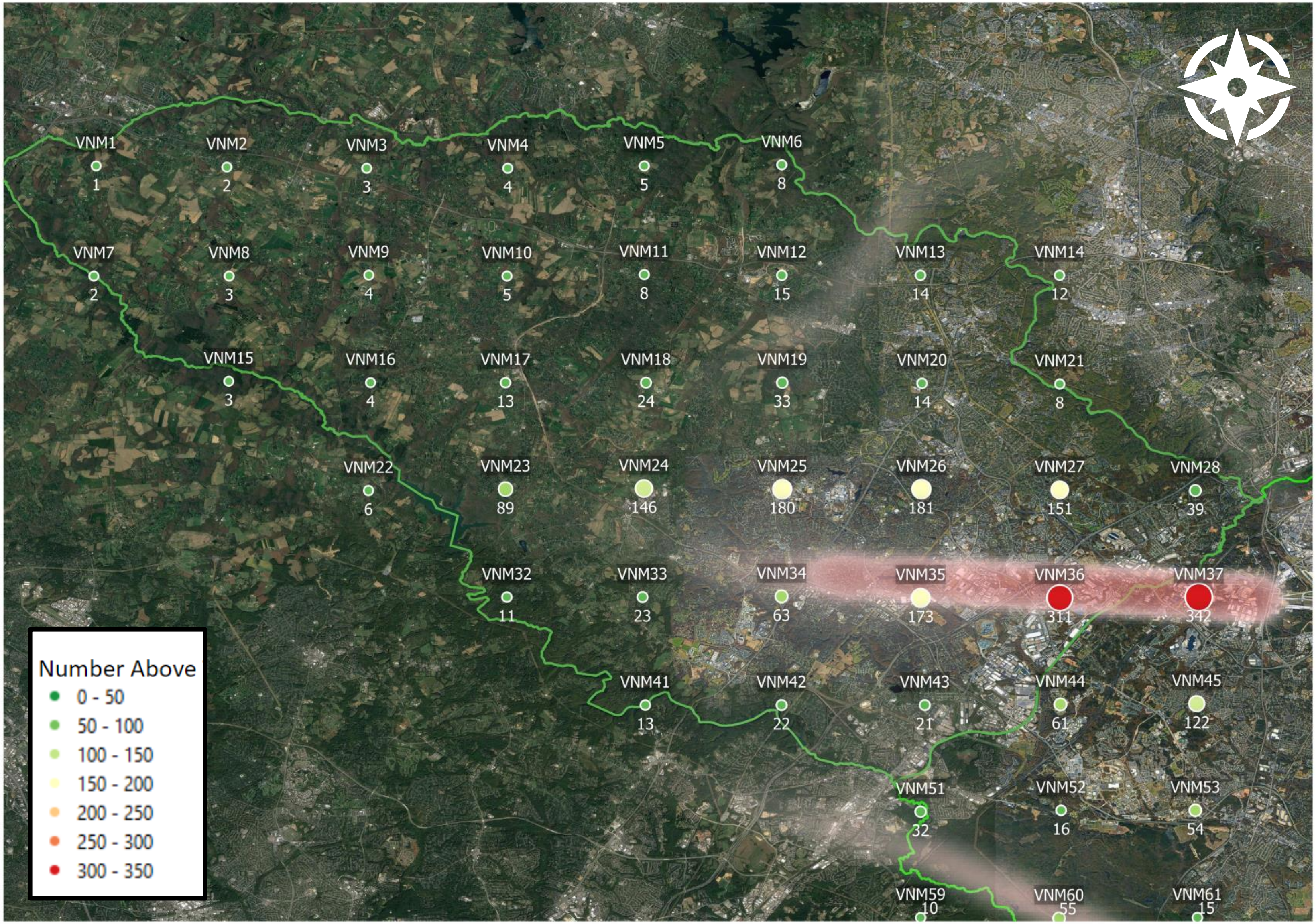
VNM85
0
VNM86
0
VNM87
0
VNM88
0
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

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

Howard County – Arrivals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VNM21 8
VNM22 6
VNM23 89
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VNM25 180
VNM26 181
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VNM32 11
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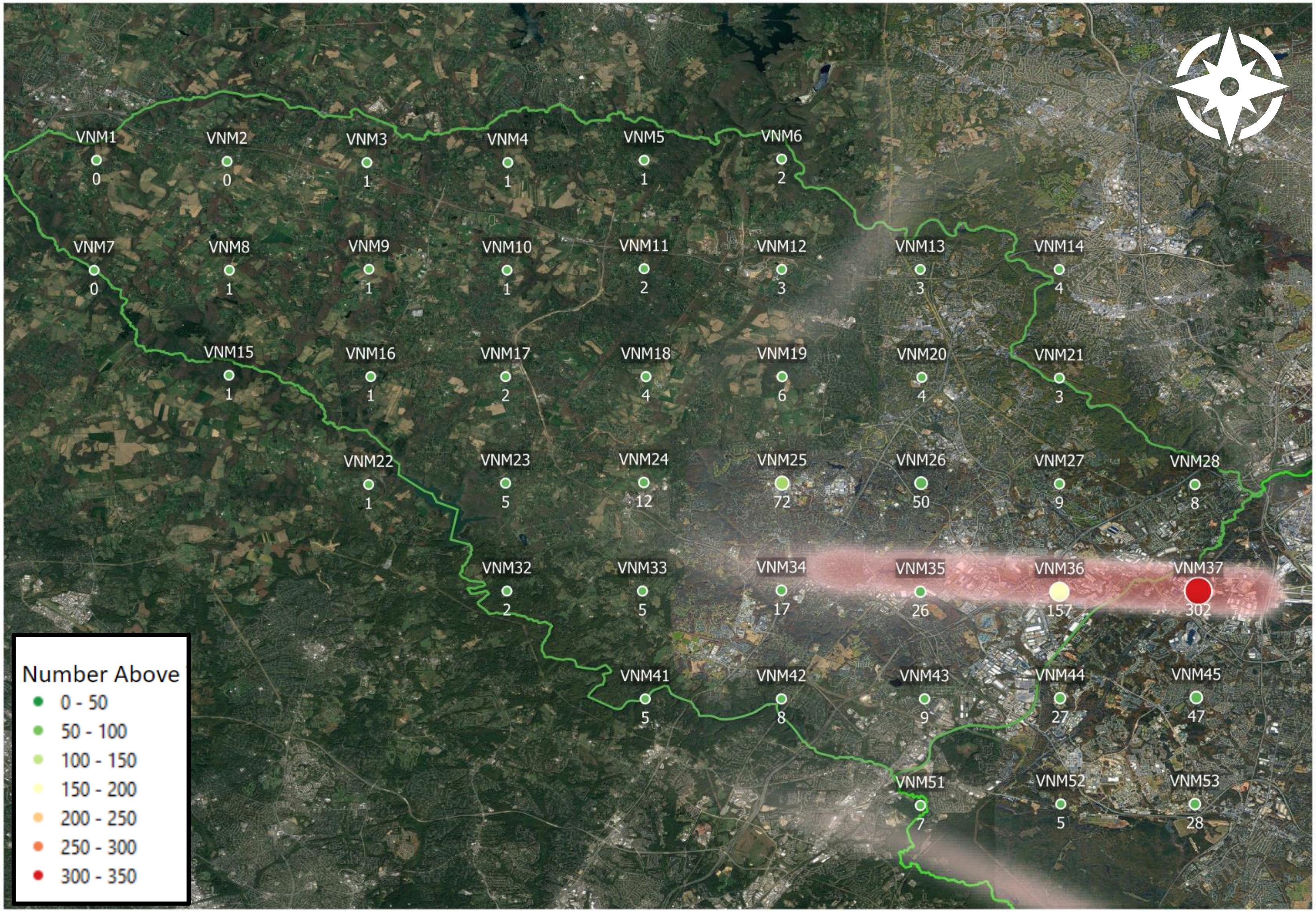
VNM35 173
VNM36 311
VNM37 342
VNM41 13
VNM42 22
VNM43 21
VNM44 61
VNM45 122
VNM51 32
VNM52 16
VNM53 54
VNM59 10
VNM60 55
VNM61 15
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

vianair

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

Howard County – Arrivals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VNM6
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VNM9
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VNM10
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VNM11
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VNM12
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VNM13
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VNM14
4
VNM15
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VNM16
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VNM20
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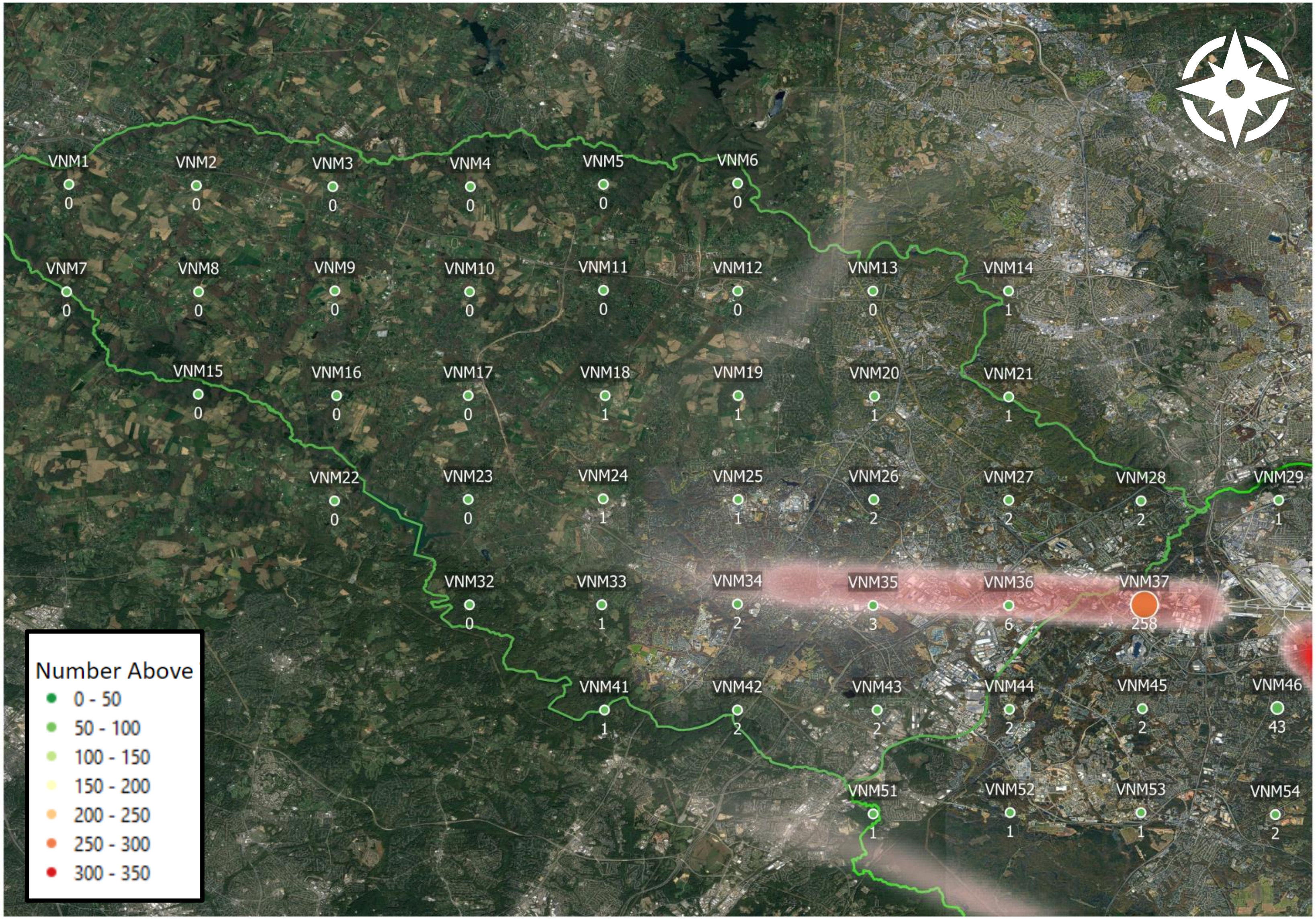
VNM21
3
VNM22
1
VNM23
5
VNM24
12
VNM25
72
VNM26
50
VNM27
9
VNM28
8
VNM32
2
VNM33
5
VNM34
17
VNM35
26
VNM36
157
VNM37
302
VNM41
5
VNM42
8
VNM43
9
VNM44
27
VNM45
47
VNM51
7
VNM52
5
VNM53
28
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

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

Howard County – Arrivals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VNM2
0
VNM3
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VNM4
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VNM5
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VNM6
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VNM7
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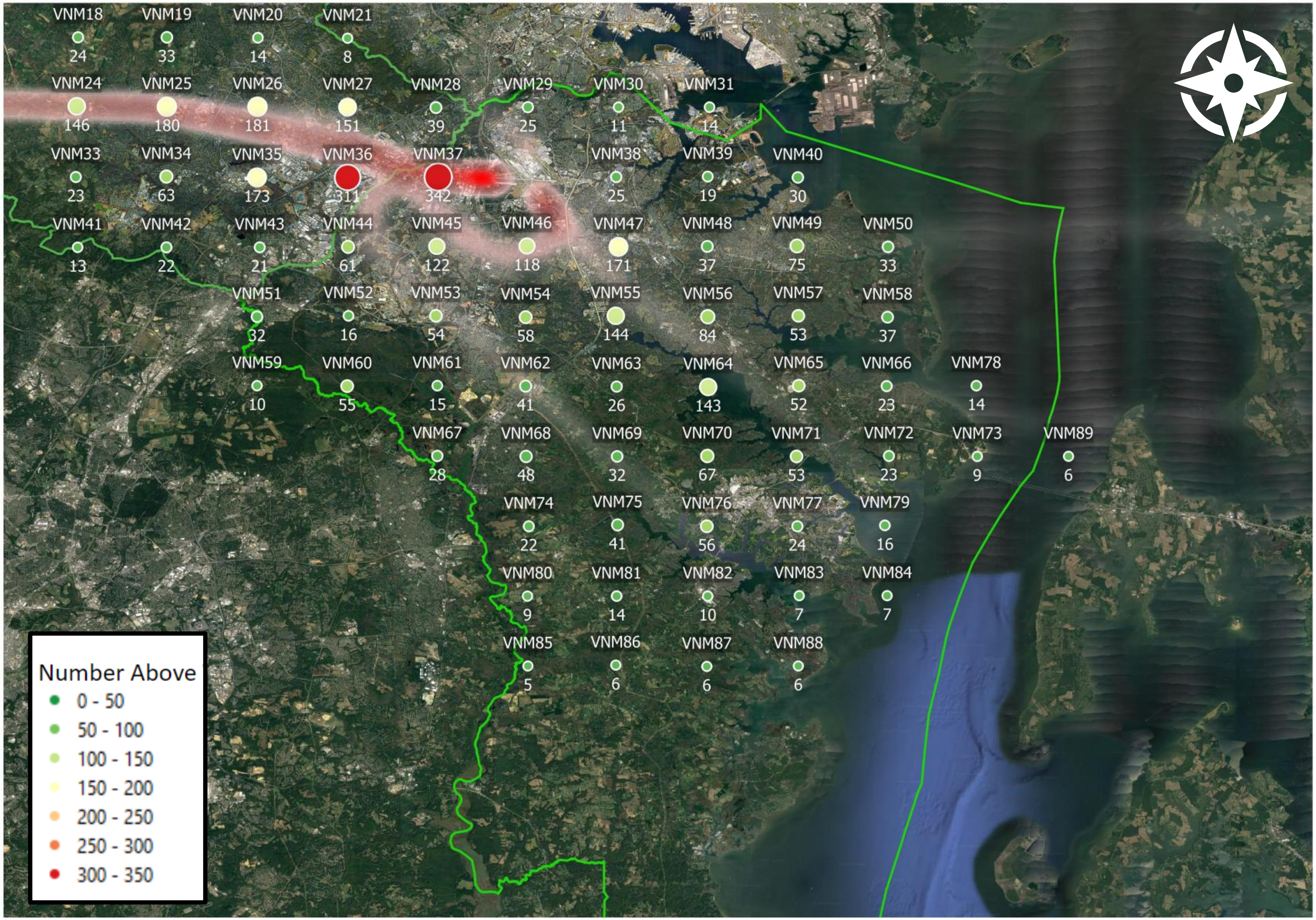
VNM8
0
VNM9
0
VNM10
0
VNM11
0
VNM12
0
VNM13
0
VNM14
1
VNM15
0
VNM16
0
VNM17
0
VNM18
1
VNM19
1
VNM20
1
VNM21
1
VNM22
0
VNM23
0
VNM24
1
VNM25
1
VNM26
2
VNM27
2
VNM28
2
VNM29
1
VNM32
0
VNM33
1
VNM34
2
VNM35
3
VNM36
6
VNM37
258
VNM41
1
VNM42
2
VNM43
2
VNM44
2
VNM45
2
VNM46
43
VNM51
1
VNM52
1
VNM53
1
VNM54
2
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

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

Howard County – Departures


VNM18 24
VNM19 33
VNM20 14
VNM21 8
VNM24 146
VNM25 180
VNM26 181
VNM27 151
VNM28 39
VNM29 25
VNM30 11
VNM31 14
VNM33 23
VNM34 63
VNM35 173
VNM36 311
VNM37 342
VNM38 25
VNM39 19
VNM40 30
VNM41 13
VNM42 22
VNM43 21
VNM44 61
VNM45 122
VNM46 118
VNM47 171
VNM48 37
VNM49 75
VNM50 33
VNM51 32
VNM52 16
VNM53 54
VNM54 58
VNM55 144
VNM56 84
VNM57 53
VNM58 37
VNM59 10
VNM60 55
VNM61 15
VNM62 41
VNM63 26
VNM64 143
VNM65 52
VNM66 23
VNM78 14
VNM67 28
VNM68 48
VNM69 32
VNM70 67
VNM71 53
VNM72 23
VNM73 9
VNM89 6
VNM74 22
VNM75 41
VNM76 56
VNM77 24
VNM79 16
VNM80 9
VNM81 14
VNM82 10
VNM83 7
VNM84 7
VNM85 5
VNM86 6
VNM87 6
VNM88 6
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

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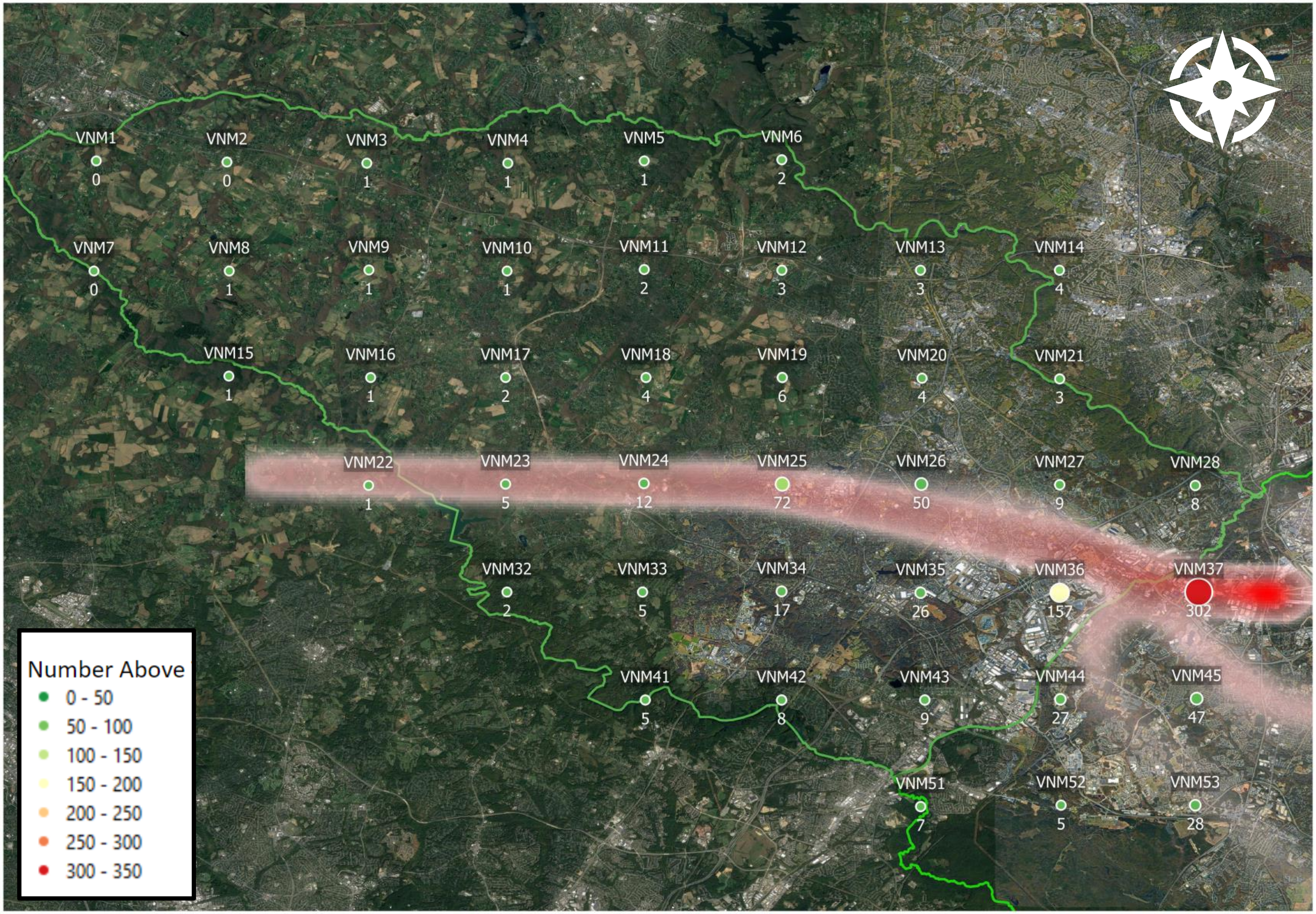
Noise Exposure: Number-of-Events-Above 65 dBA *(Daily Average)*

Howard County – Departures


VNM1
0
VNM2
0
VNM3
1
VNM4
1
VNM5
1
VNM6
2
VNM7
0
VNM8
1
VNM9
1
VNM10
1
VNM11
2
VNM12
3
VNM13
3
VNM14
4
VNM15
1
VNM16
1
VNM17
2
VNM18
4
VNM19
6
VNM20
4
VNM21
3
VNM22
1
VNM23
5
VNM24
12
VNM25
72
VNM26
50
VNM27
9
VNM28
8
VNM32
2
VNM33
5
VNM34
17
VNM35
26
VNM36
157
VNM37
302
VNM41
5
VNM42
8
VNM43
9
VNM44
27
VNM45
47
VNM51
7
VNM52
5
VNM53
28
Number Above
● 0 - 50
● 50 - 100
● 100 - 150
● 150 - 200
● 200 - 250
● 250 - 300
● 300 - 350

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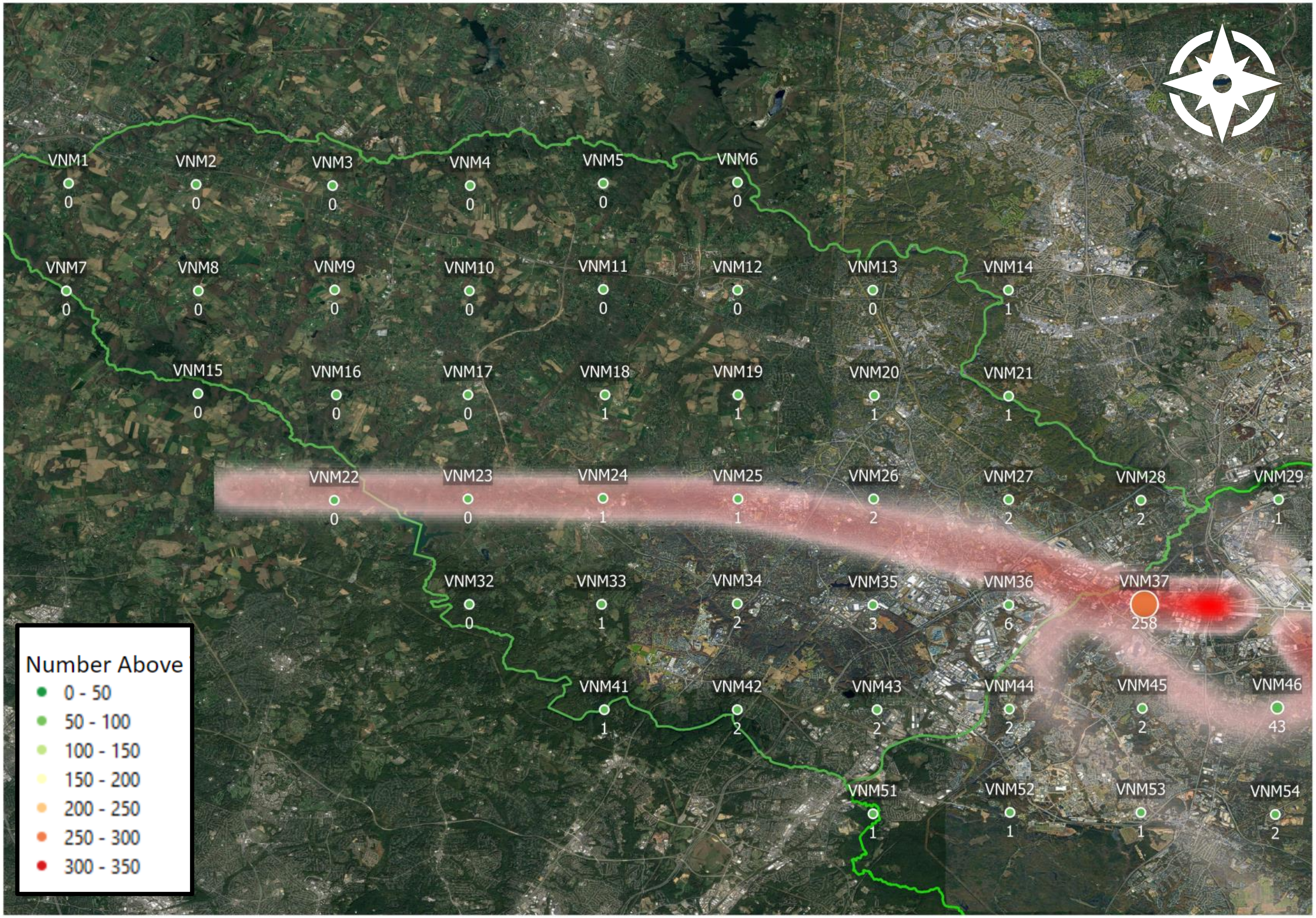
Noise Exposure: Number-of-Events-Above 75 dBA *(Daily Average)*

Howard County – Departures


VNM1
0
VNM2
0
VNM3
0
VNM4
0
VNM5
0
VNM6
0
VNM7
0
VNM8
0
VNM9
0
VNM10
0
VNM11
0
VNM12
0
VNM13
0
VNM14
1
VNM15
0
VNM16
0
VNM17
0
VNM18
1
VNM19
1
VNM20
1
VNM21
1
VNM22
0
VNM23
0
VNM24
1
VNM25
1
VNM26
2
VNM27
2
VNM28
2
VNM29
1
VNM32
0
VNM33
1
VNM34
2
VNM35
3
VNM36
6
VNM37
258
VNM41
1
VNM42
2
VNM43
2
VNM44
2
VNM45
2
VNM46
43
VNM51
1
VNM52
1
VNM53
1
VNM54
2
Number Above
0 - 50
50 - 100
100 - 150
150 - 200
200 - 250
250 - 300
300 - 350

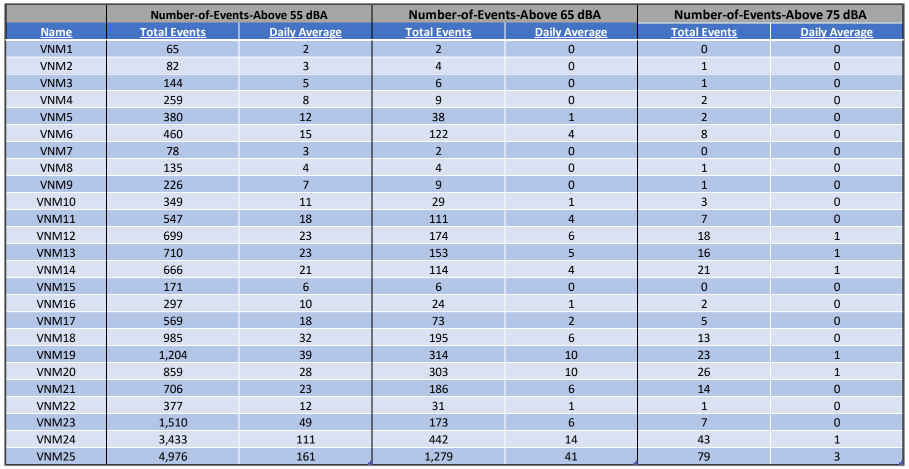
Noise Event Data

DNL

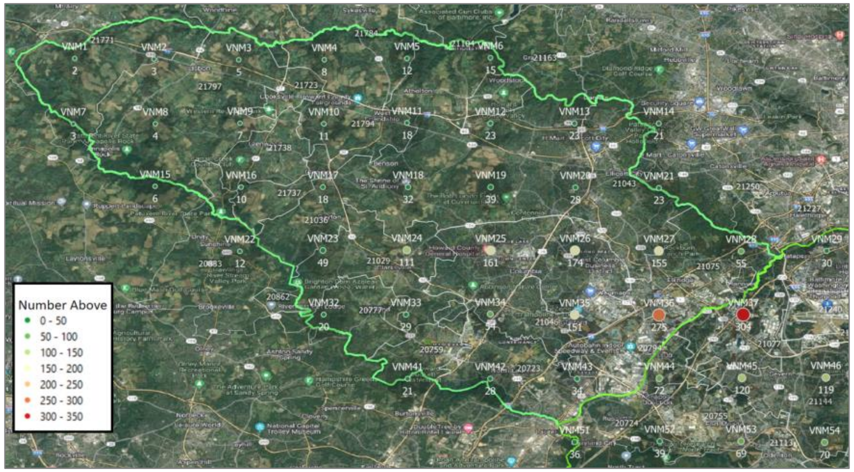
The following slides include aircraft noise exposure levels at each of the 125 locations based on the Day-Night Level (DNL) metric. The average daily DNL level for each location is included in the tables.

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



Noise Exposure: DNL *(Daily Average)*

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

Name	DNL
VNM1	26.9
VNM2	29.0
VNM3	30.3
VNM4	31.0
VNM5	33.5
VNM6	39.8
VNM7	26.1
VNM8	28.3
VNM9	30.7
VNM10	34.2
VNM11	40.8
VNM12	44.7
VNM13	44.1
VNM14	46.2
VNM15	29.2
VNM16	36.7
VNM17	41.8
VNM18	47.1
VNM19	49.0
VNM20	48.4
VNM21	46.8
VNM22	36.3
VNM23	46.4
VNM24	54.0
VNM25	57.0

Name	DNL
VNM26	57.4
VNM27	53.7
VNM28	51.8
VNM29	51.0
VNM30	43.9
VNM31	42.2
VNM32	41.2
VNM33	46.9
VNM34	52.0
VNM35	56.2
VNM36	61.2
VNM37	73.8
VNM38	54.7
VNM39	50.1
VNM40	48.9
VNM41	42.2
VNM42	47.6
VNM43	50.3
VNM44	54.8
VNM45	56.9
VNM46	64.6
VNM47	68.5
VNM48	62.8
VNM49	58.4
VNM50	48.1

Name	DNL
VNM51	50.3
VNM52	47.9
VNM53	52.3
VNM54	50.6
VNM55	54.9
VNM56	58.1
VNM57	52.1
VNM58	49.5
VNM59	45.3
VNM60	50.5
VNM61	47.0
VNM62	49.5
VNM63	49.9
VNM64	55.6
VNM65	51.5
VNM66	47.6
VNM67	45.4
VNM68	48.2
VNM69	46.6
VNM70	50.7
VNM71	49.1
VNM72	44.2
VNM73	39.2
VNM74	44.4
VNM75	46.0

Name	DNL
VNM76	47.3
VNM77	43.7
VNM78	42.1
VNM79	39.4
VNM80	37.4
VNM81	38.7
VNM82	37.9
VNM83	35.1
VNM84	32.9
VNM85	31.6
VNM86	31.5
VNM87	31.0
VNM88	29.5
VNM89	34.3

Noise Exposure: DNL *(Daily Average)*

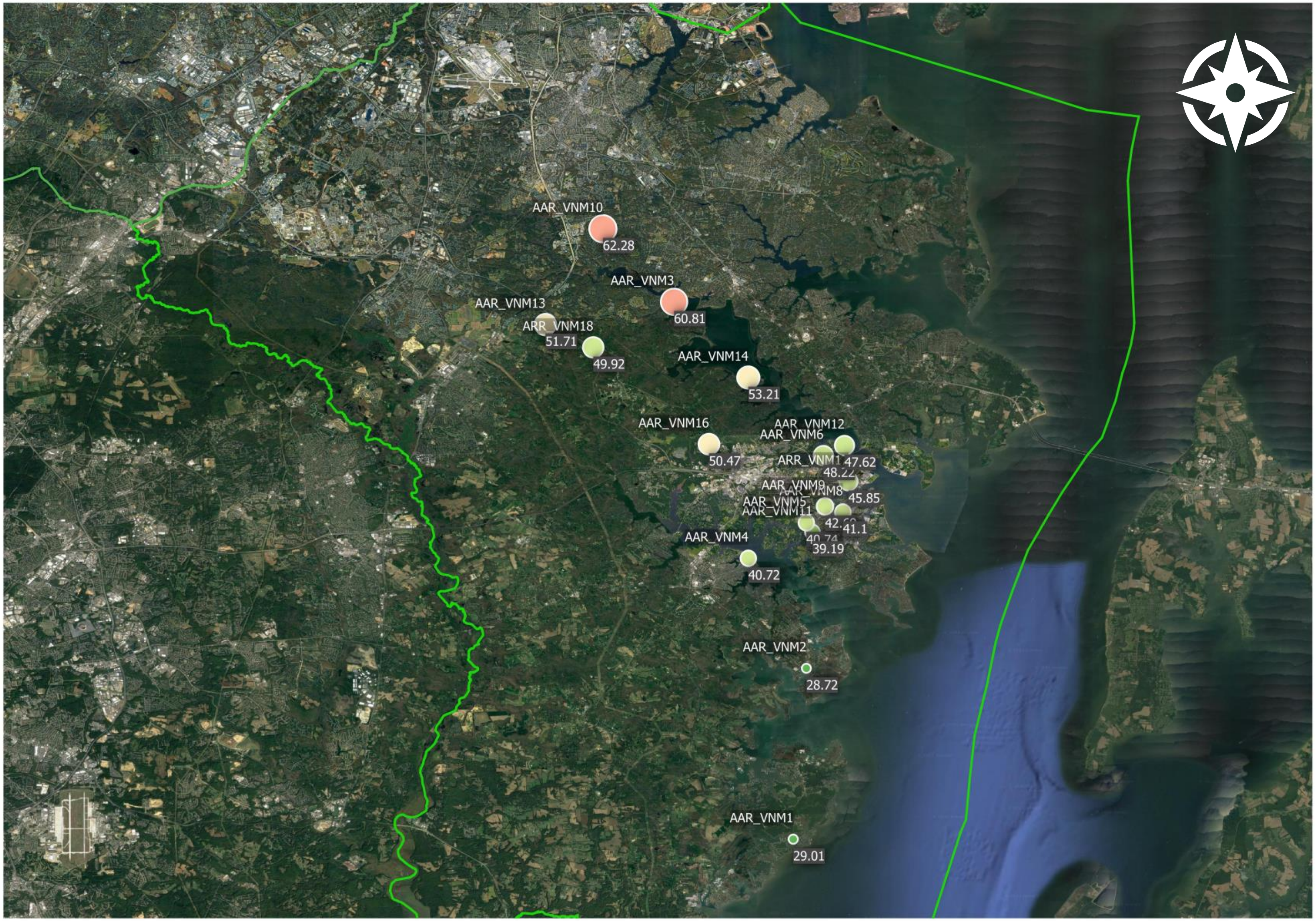
Landmark VNMs

Name	DNL
HOCO_VNM1	59.6
HOCO_VNM2	53.5
HOCO_VNM3	52.7
HOCO_VNM4	56.9
HOCO_VNM5	58.1
HOCO_VNM6	58.9
HOCO_VNM7	59.5
HOCO_VNM8	62.1
HOCO_VNM9	60.6
HOCO_VNM10	55.5
HOCO_VNM11	41.0
HOCO_VNM12	55.9
HOCO_VNM13	60.1
HOCO_VNM14	62.3
HOCO_VNM15	46.6
HOCO_VNM16	61.1
HOCO_VNM17	68.8
HOCO_VNM18	51.9

Name	DNL
AAR_VNM1	23.9
AAR_VNM2	30.3
AAR_VNM3	59.5
AAR_VNM4	41.0
AAR_VNM5	41.5
AAR_VNM6	47.9
AAR_VNM7	21.7
AAR_VNM8	41.6
AAR_VNM9	43.3
AAR_VNM10	62.5
AAR_VNM11	40.1
AAR_VNM12	47.1
AAR_VNM13	50.8
AAR_VNM14	52.0
ARR_VNM15	34.7
AAR_VNM16	49.7
ARR_VNM17	45.4
ARR_VNM18	49.3

Noise Exposure: DNL (Daily Average)

Anne Arundel County – Landmark Locations


AAR_VNM10
62.28
AAR_VNM3
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AAR_VNM13
ARR_VNM18
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49.92
AAR_VNM14
53.21
AAR_VNM16
50.47
AAR_VNM12
AAR_VNM6
ARR_VNM1
47.62
48.22
AAR_VNM9
AAR_VNM8
45.85
AAR_VNM5
AAR_VNM11
42.
41.1
40.74
39.19
AAR_VNM4
40.72
AAR_VNM2
28.72
AAR_VNM1
29.01

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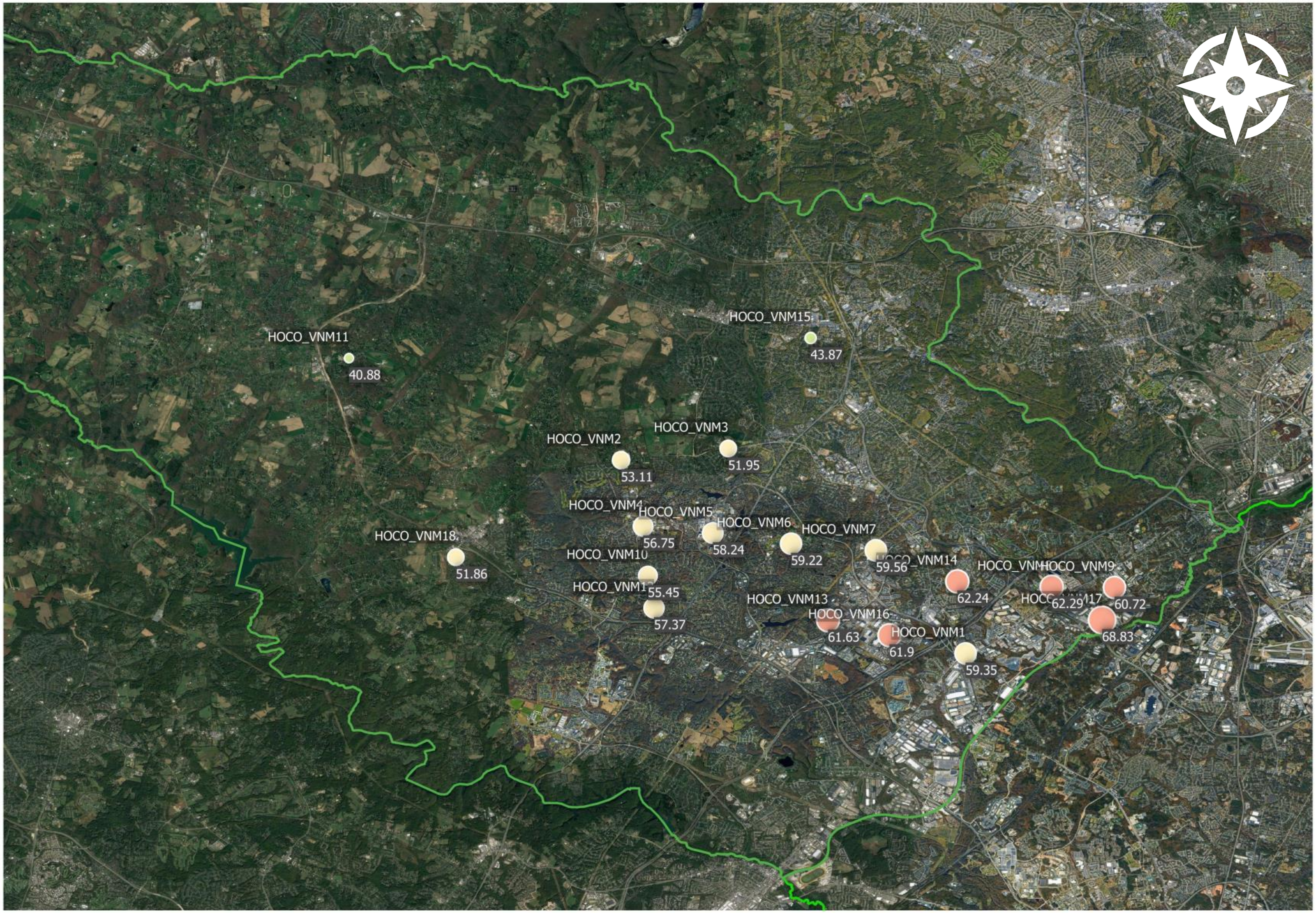
Noise Exposure: DNL (Daily Average)

Howard County – Landmark Locations


HOCO_VNM15
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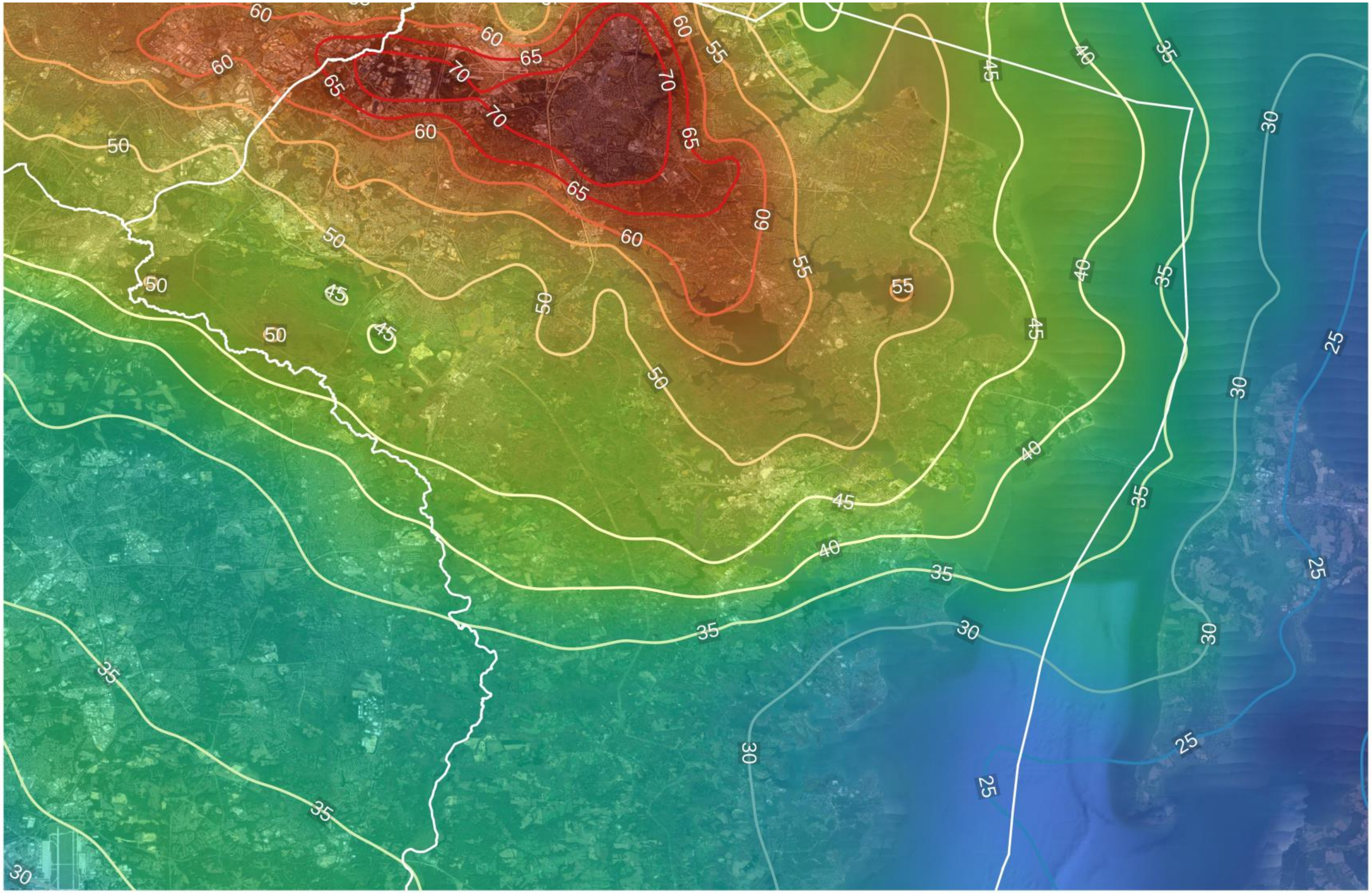
HOCO_VNM11
40.88
HOCO_VNM3
51.95
HOCO_VNM2
53.11
HOCO_VNM4
56.75
HOCO_VNM5
58.24
HOCO_VNM6
59.22
HOCO_VNM7
59.56
HOCO_VNM14
HOCO_VNM18
51.86
HOCO_VNM10
HOCO_VNM1
55.45
57.37
HOCO_VNM
HOCO_VNM9
62.24
HOCO
62.29
17
60.72
68.83
HOCO_VNM13
HOCO_VNM16
61.63
HOCO_VNM1
61.9
59.35

Noise Exposure: DNL Contours (Daily Average)

Anne Arundel County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35
35
35
35
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30
25
25
25
25

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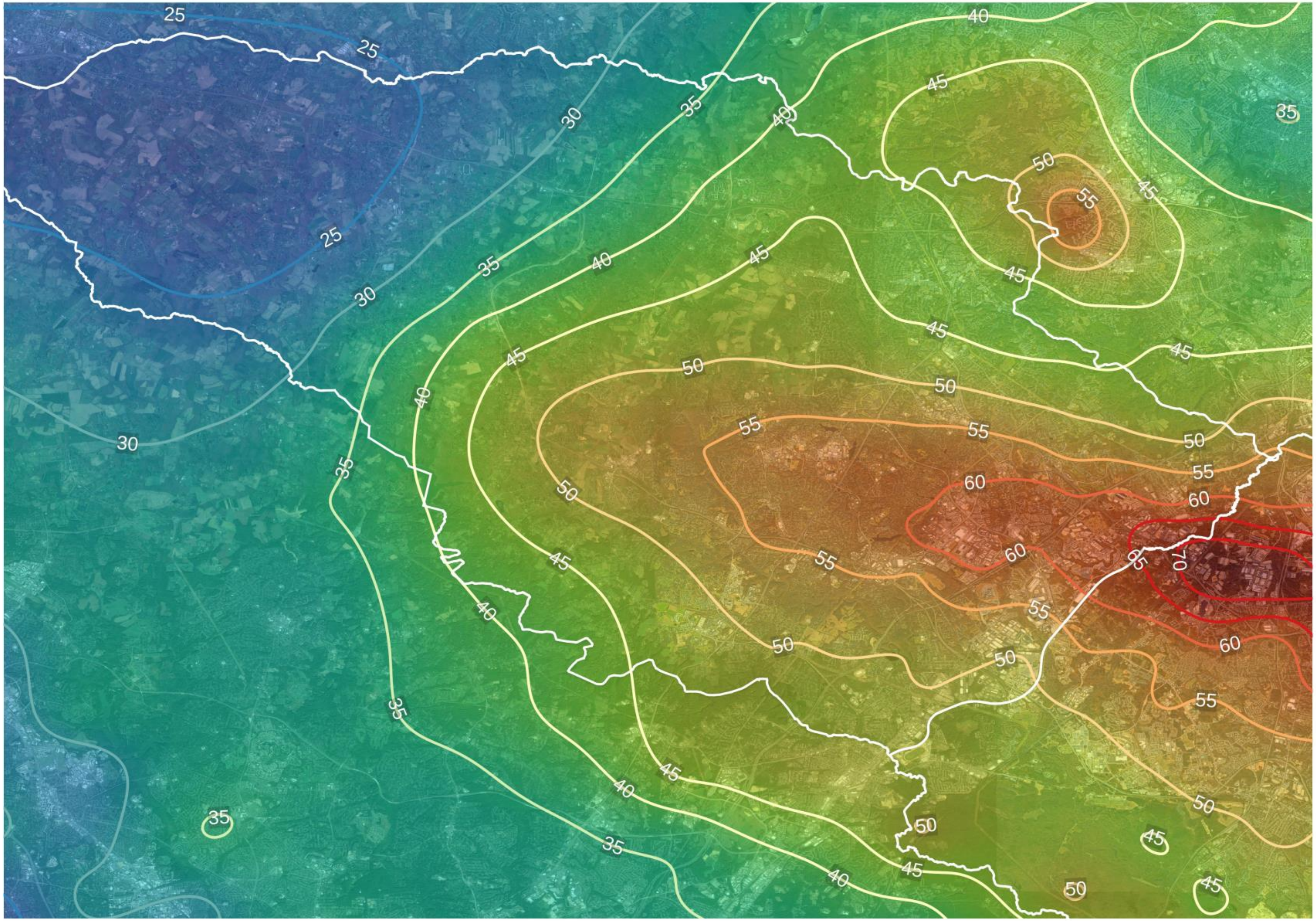
Noise Exposure: DNL Contours (Daily Average)

Howard County


25
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45
35
50
55
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30
45
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50
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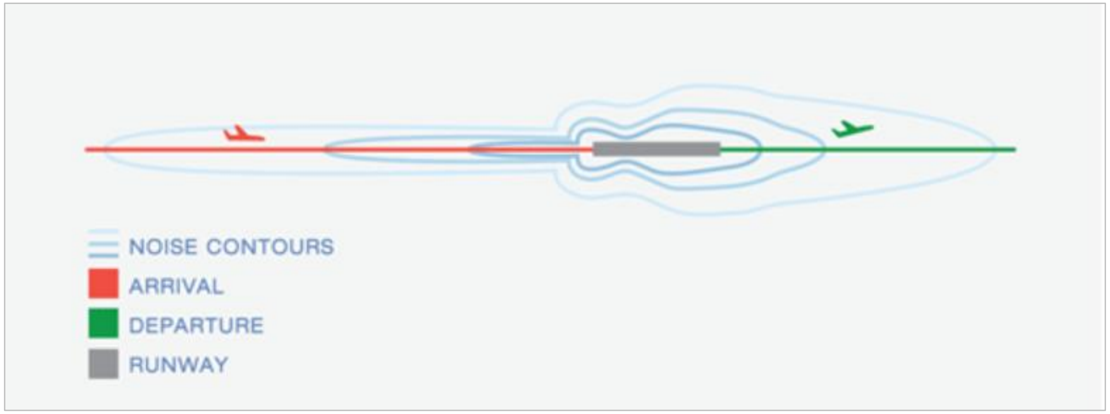
55
55
30
50
35
60
55
60
50
45
60
55
65
70
40
55
50
50
60
35
55
45
40
50
50
35
45
40
45
50
45

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).

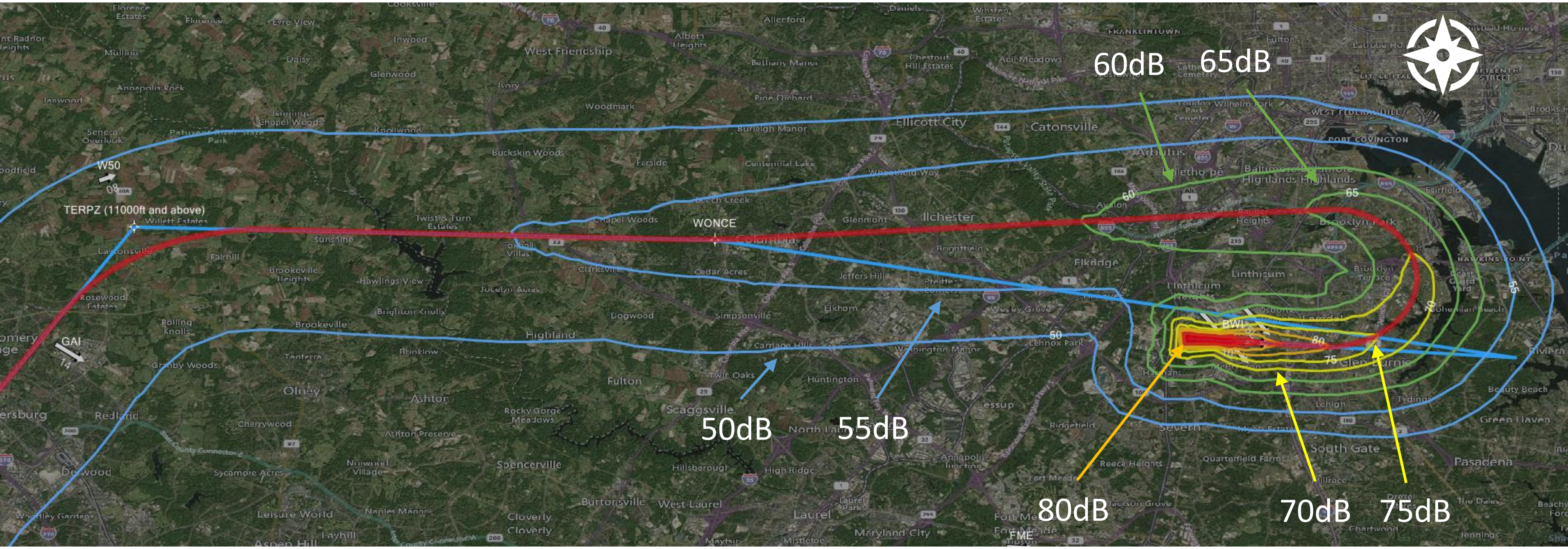


Source: Federal Aviation Administration (https://www.faa.gov/regulations_policies/policy_guidance/noise/basics)

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


60dB
65dB
50dB
55dB
80dB
70dB
75dB
W50
TERPZ (11000ft and above)
WONCE
GAI
BWI
Ellicott City
Catonsville
Columbia
Laurel
Olney
Glen Burnie
Pasadena
60
65
70
75
80
50
55

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

Noise contours based on A-weighted decibels (dBA)

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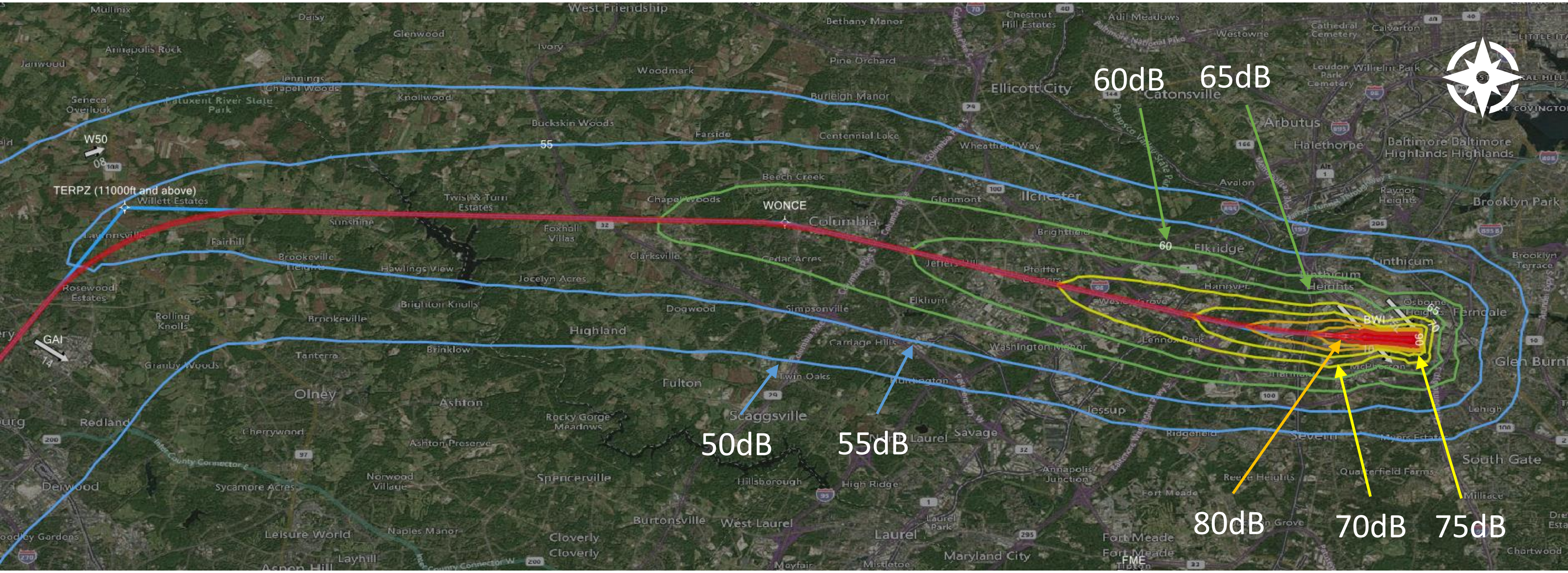
Single Event Noise Contours

L_{max} 737-700 Departure RWY 28


60dB
65dB
TERPZ (11000ft and above)
W50
WONCE
GAI
BWI
60
55
50dB
55dB
80dB
70dB
75dB

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

Noise contours based on A-weighted decibels (dBA)

For More Information…

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

transportation@howardcountymd.gov

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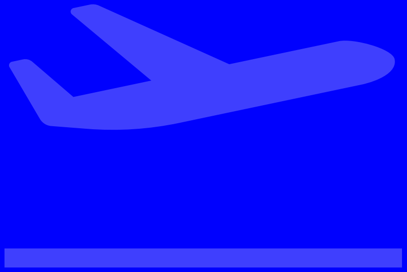
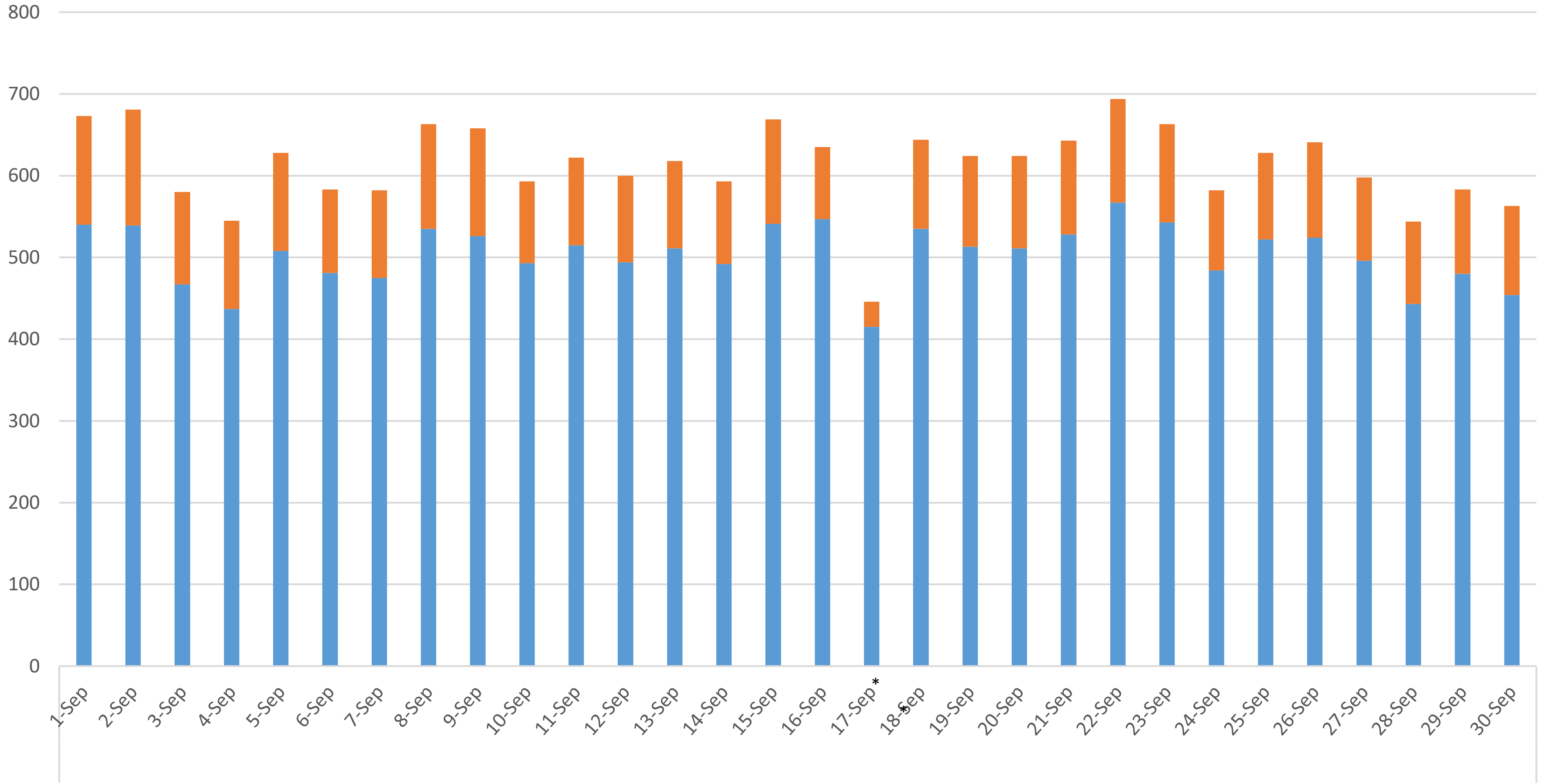
APPENDIX I:

SUPPLEMENTAL OPERATIONAL STATISTICS



Total Operations



* The data feed used to conduct monthly operations analyses was missing several hours of data for September 17th.

Total Monthly Operations	18,400
Average Daily Operations	613

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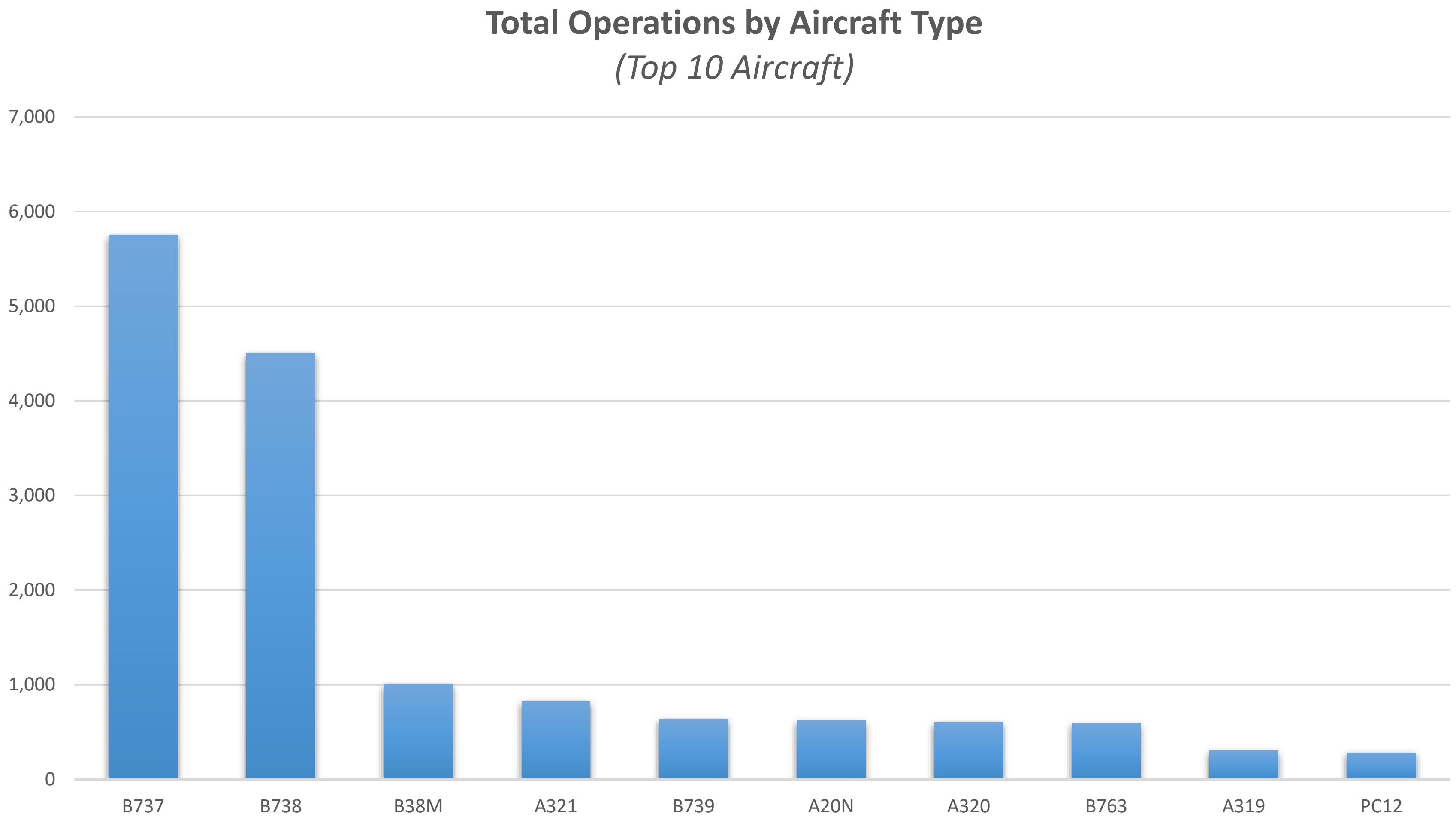
Fleet Mix: Operations by Aircraft Type (Top 10 Aircraft Types)



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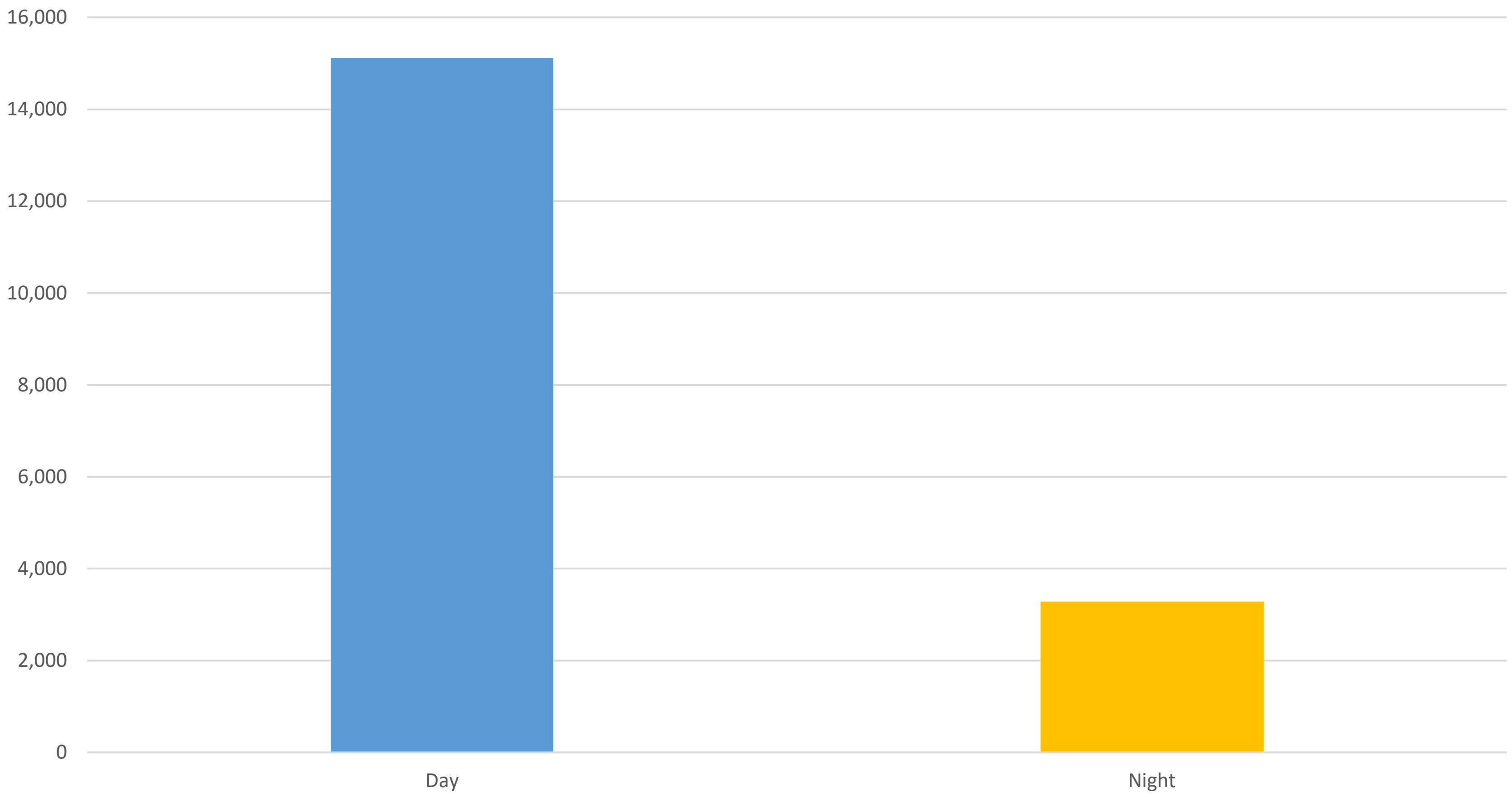
Total Operations: Daytime vs. Nighttime



“Nighttime Hours” are from 10PM - 7AM

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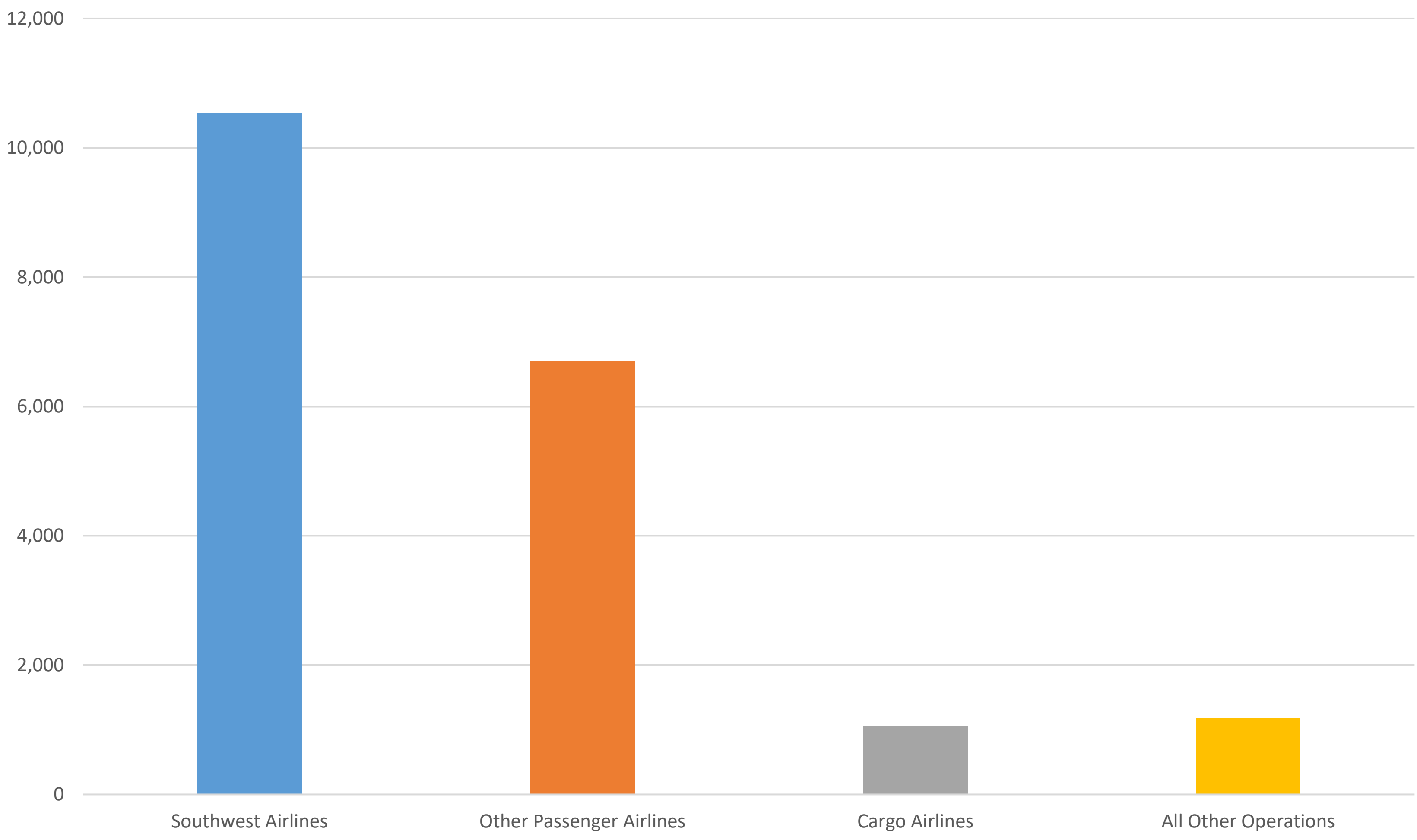
Total Operations: Southwest Airlines vs. Other



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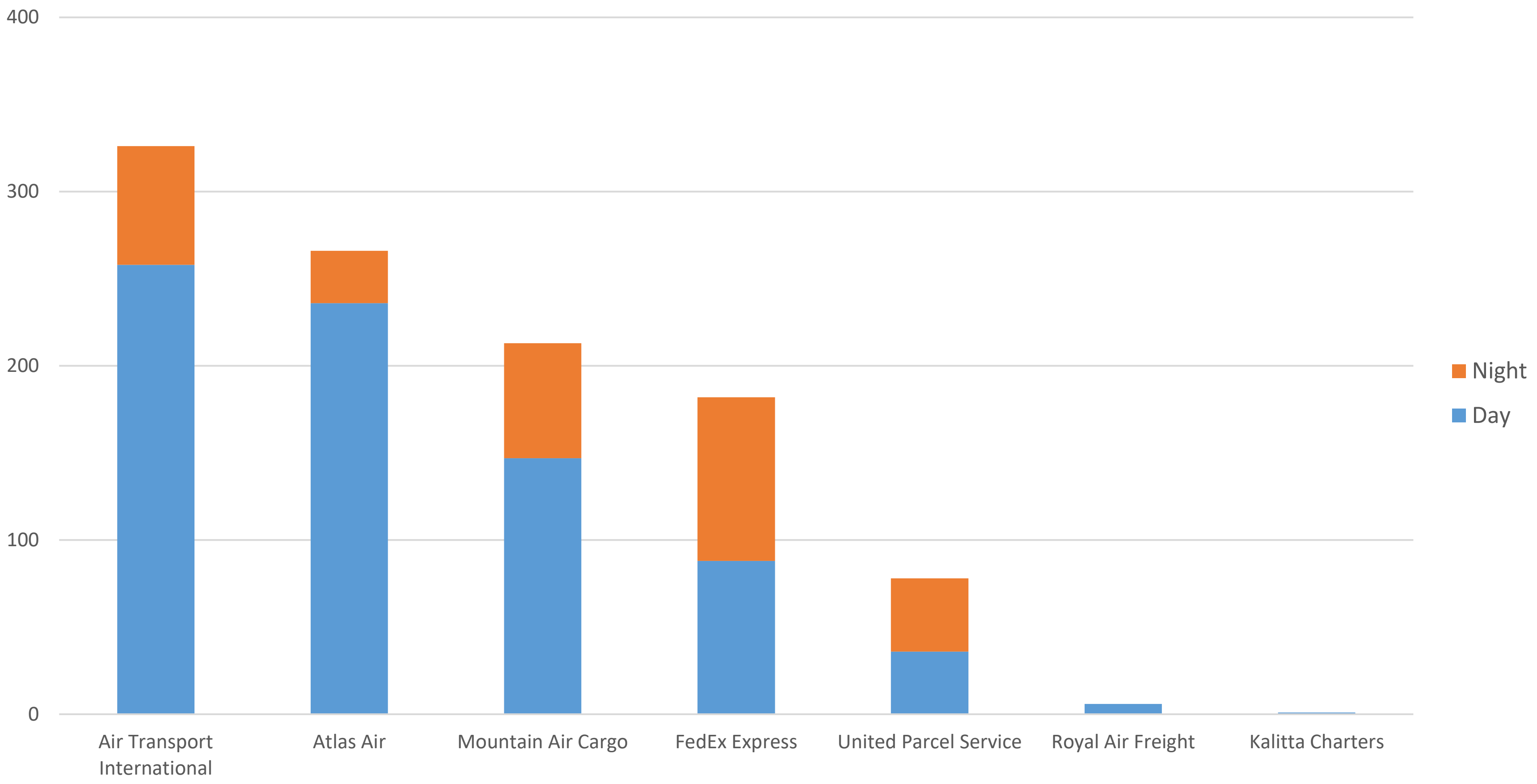
Cargo Operations: Daytime versus Nighttime



Nighttime hours are from 10PM-7AM.

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