



DCA AIRPLANE NOISE ASSESSMENT

Public Community Meeting
September 20, 2018

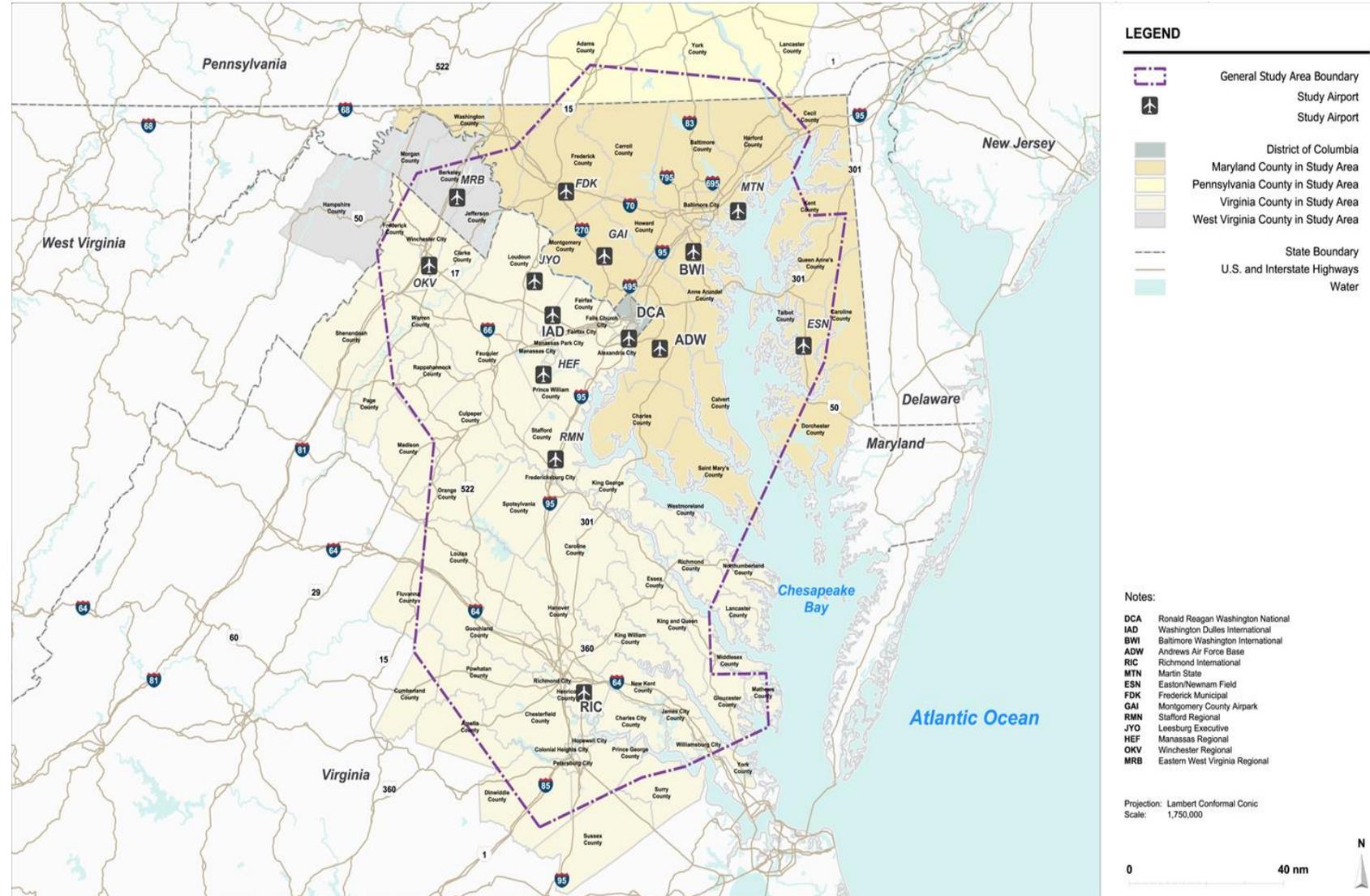
CSDA | DESIGN
GROUP

★ ★ ★ DEPARTMENT
OF ENERGY &
ENVIRONMENT

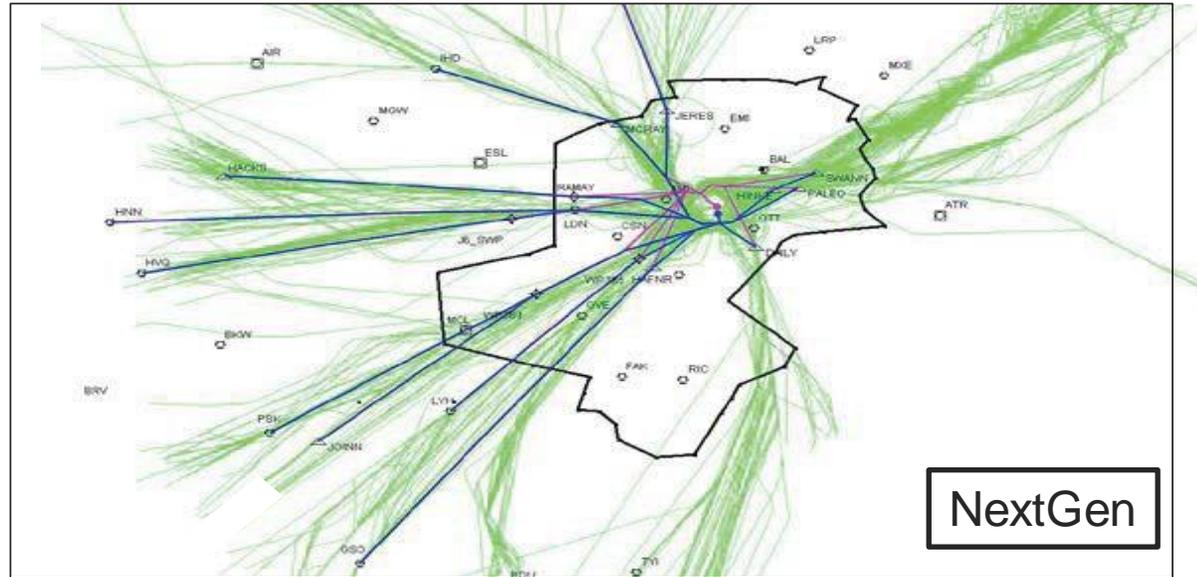
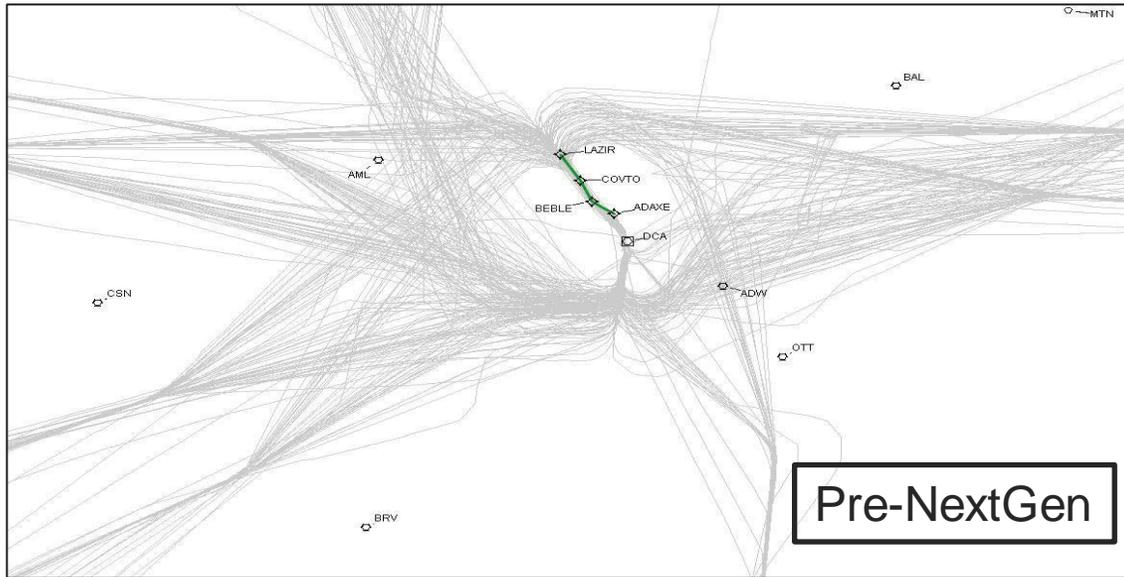
WHY PERFORM THIS ASSESSMENT? NEXTGEN!

- A new national airspace system transforming America's air traffic control system from a ground-based navigation/radar system with radio communication, to a satellite-based (GPS) system
- Implementation across the U.S. from 2004 to 2025
- Advantages:
 - shorter routes (more direct)
 - saves time and fuel
 - reduces traffic delays
 - increases capacity
 - minimizes voice communication
 - greater safety
 - reduces ATC & cockpit workload
 - reduces air pollution
- Disadvantage:
 - New air traffic control routes were established over noise-sensitive areas
 - Concentration (less dispersion) of flight paths
- NextGen implemented at the Ronald Reagan Washington National Airport (DCA) beginning in 2011

WASHINGTON METROPLEX STUDY AREA



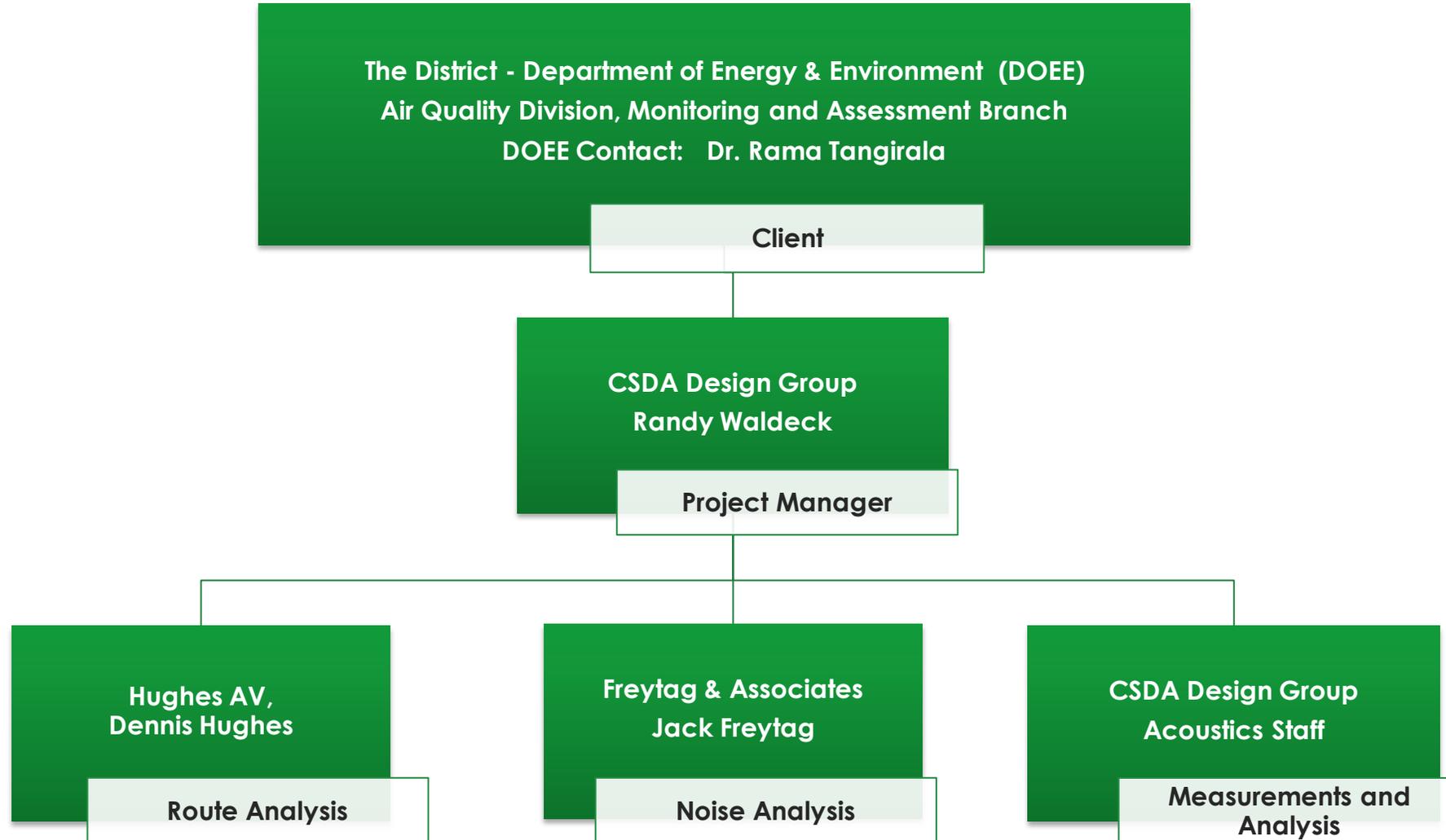
WASHINGTON, DC METROPLEX



PROJECT OBJECTIVES

- Investigate noise impacts from DCA air traffic operations
- Review existing data and conducted new investigations
- Document past and current airplane noise environment over the District
- Review current noise abatement procedures
- Measure and model DCA aircraft noise over the District
- Identify and develop revised air traffic procedures, acceptable to the FAA, to minimize the current noise impact on the District

PROJECT TEAM



PROJECT ACTIVITIES: Existing Assessment

- Noise complaints – historical review
- Published air routes – review and assess
- DCA noise monitoring records – review and assess
 - North vs. South Flow

PROJECT ACTIVITIES: Field Measurements

- Noise monitoring in the community
 - Sleep interference study
 - Classroom disruption study
 - Validate MWAA NMT data
 - DNL and other supplemental noise metrics

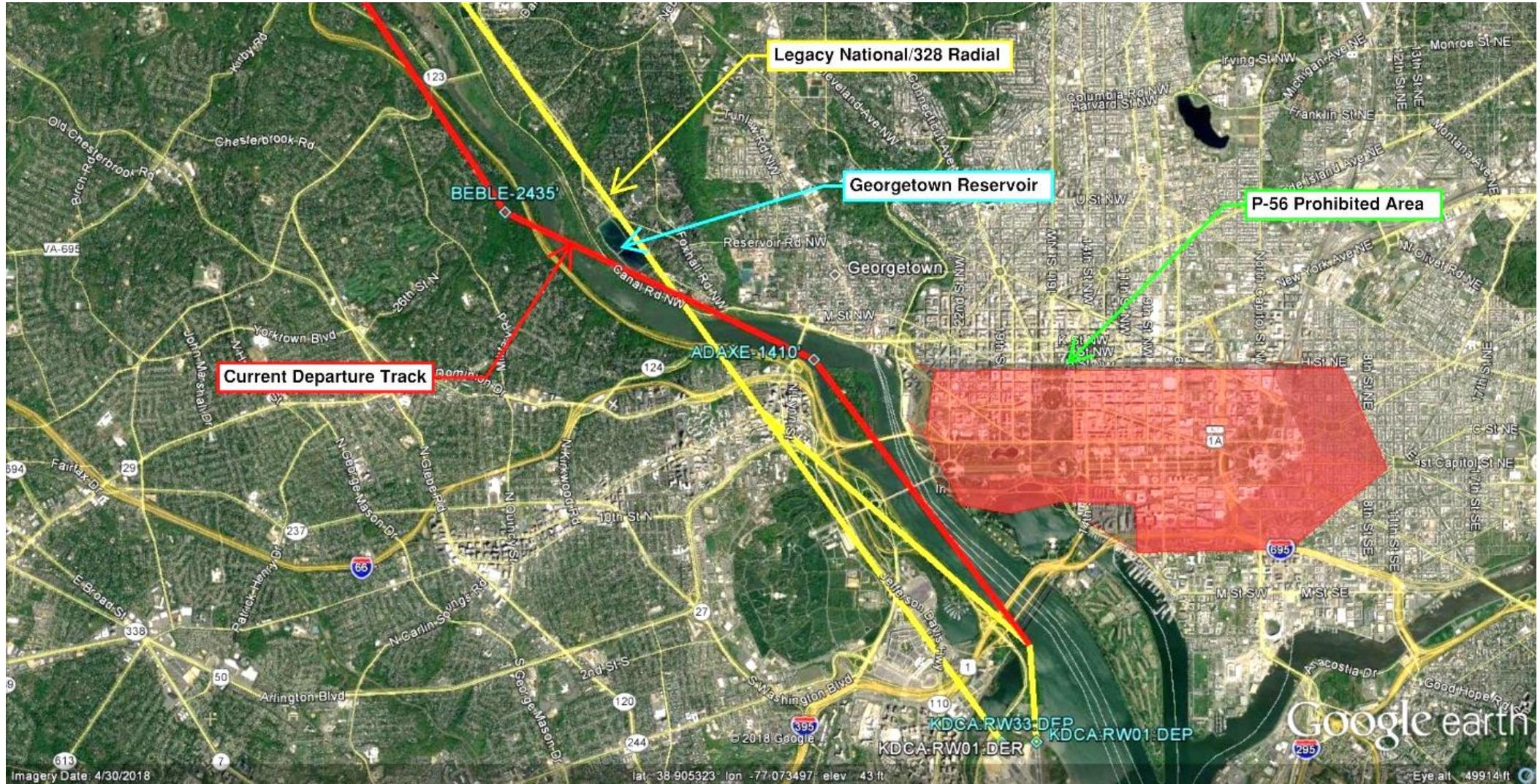
PROJECT ACTIVITIES: Noise Modeling and Recommendations

- Computer noise modeling – past and present
 - North vs. South Flow
- Recommend new air traffic control routes and procedures
- Comprehensive Report

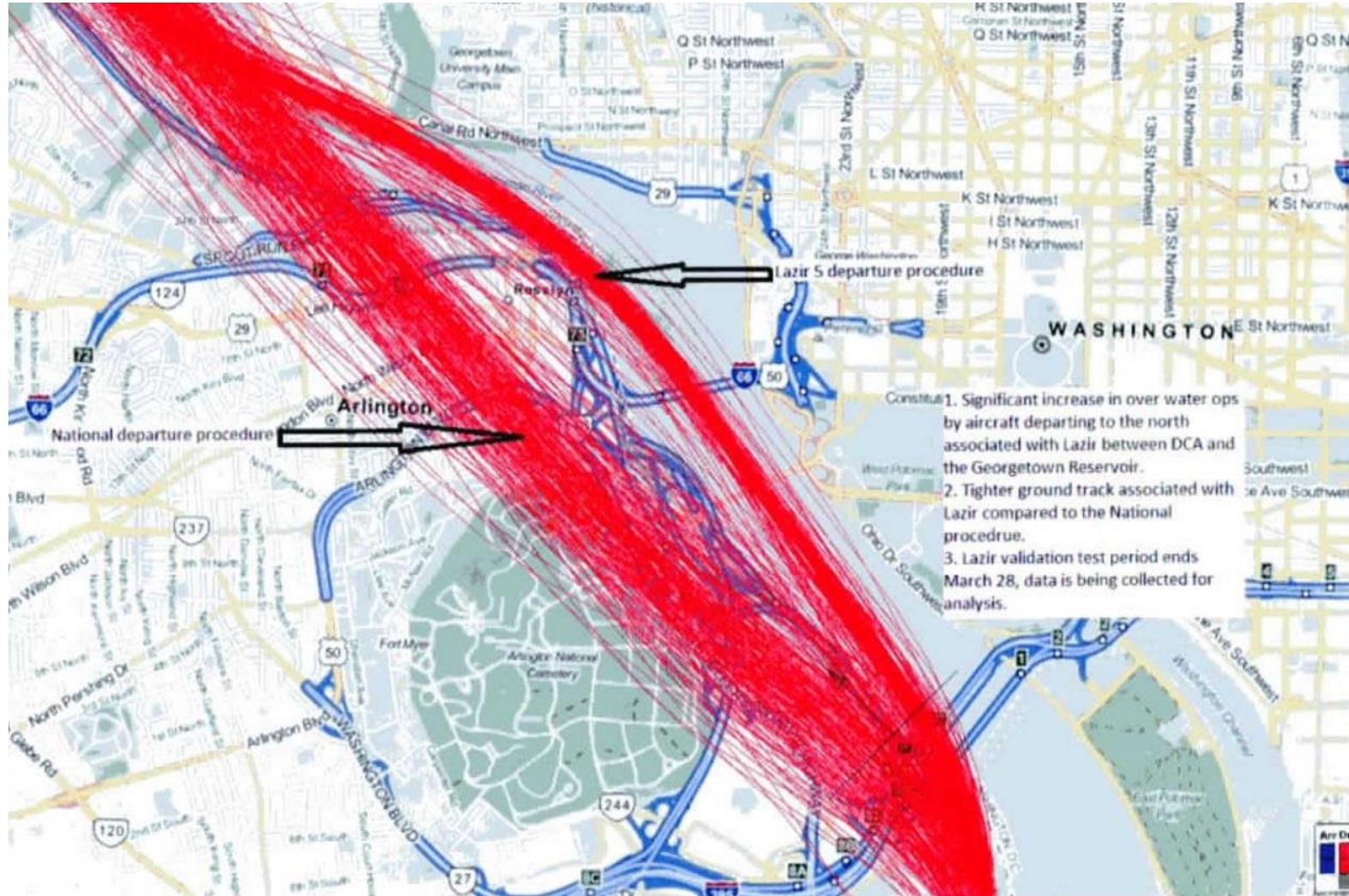
DCA ROUTE CHANGES (2015)

- Departure tracks changed to over the Potomac River (moved east)
- Increased usage of River departure, near abandonment of NATIONAL 328 departure route over Arlington
- Arrival tracks condensed over the River

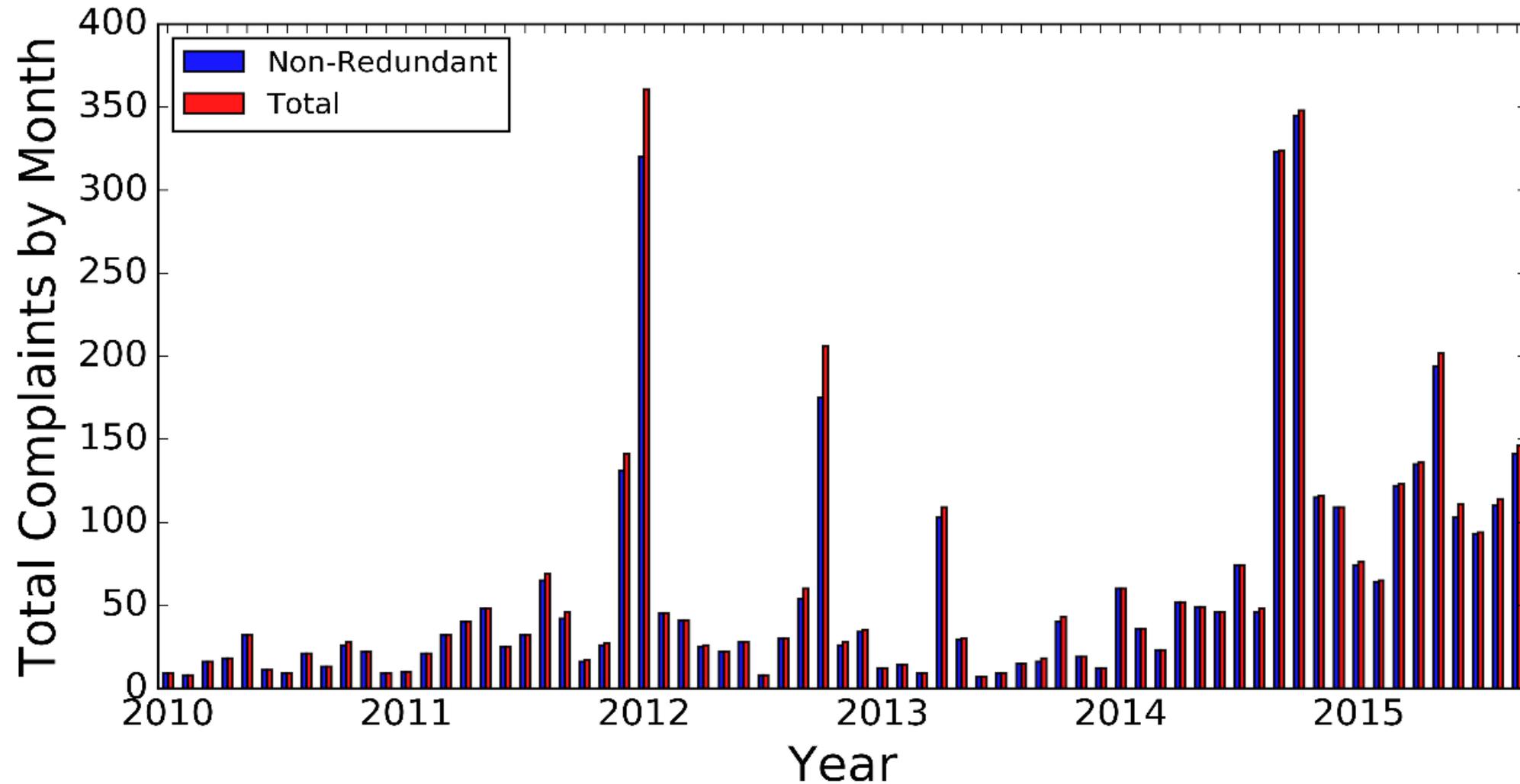
RWY 01 DEPARTURE PATH



RWY 01 DEPARTURE: 3/2015 FLIGHT TRACKS

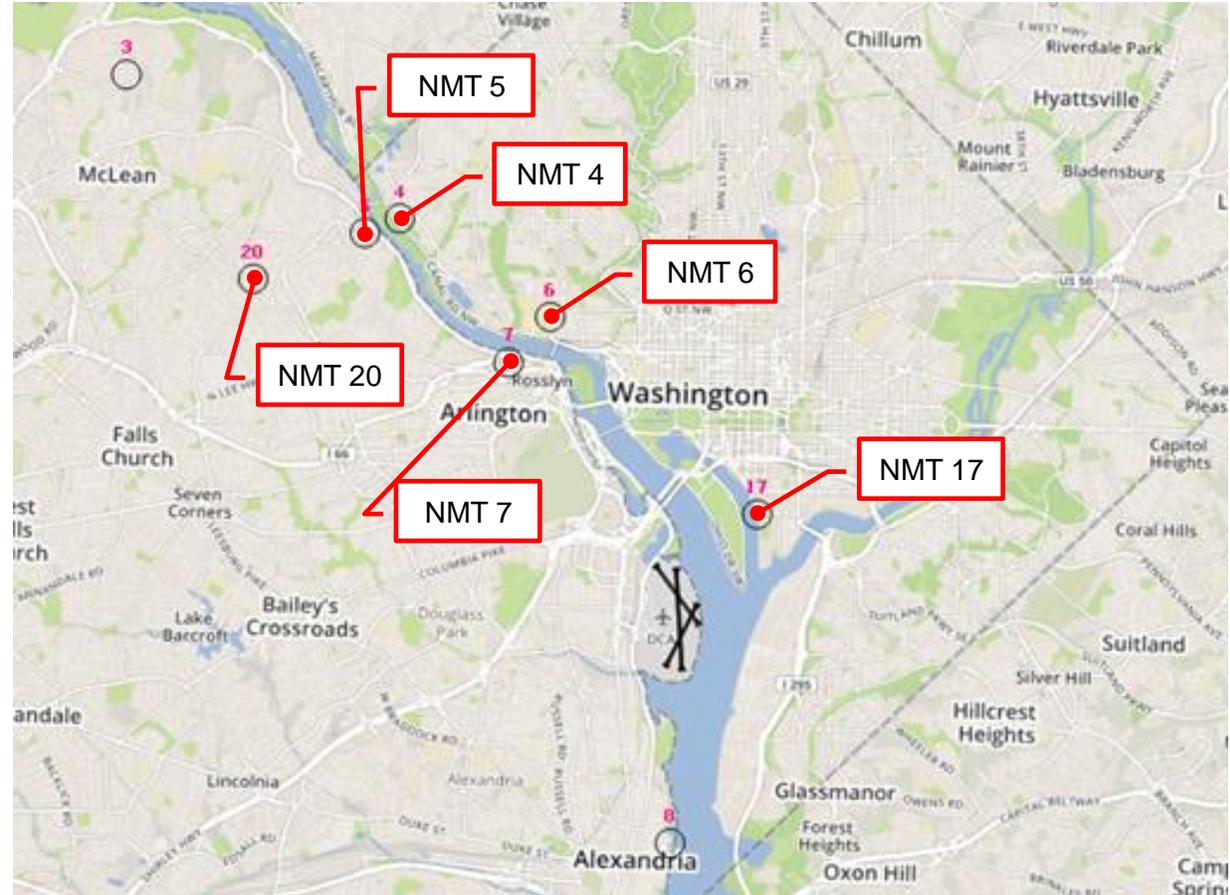
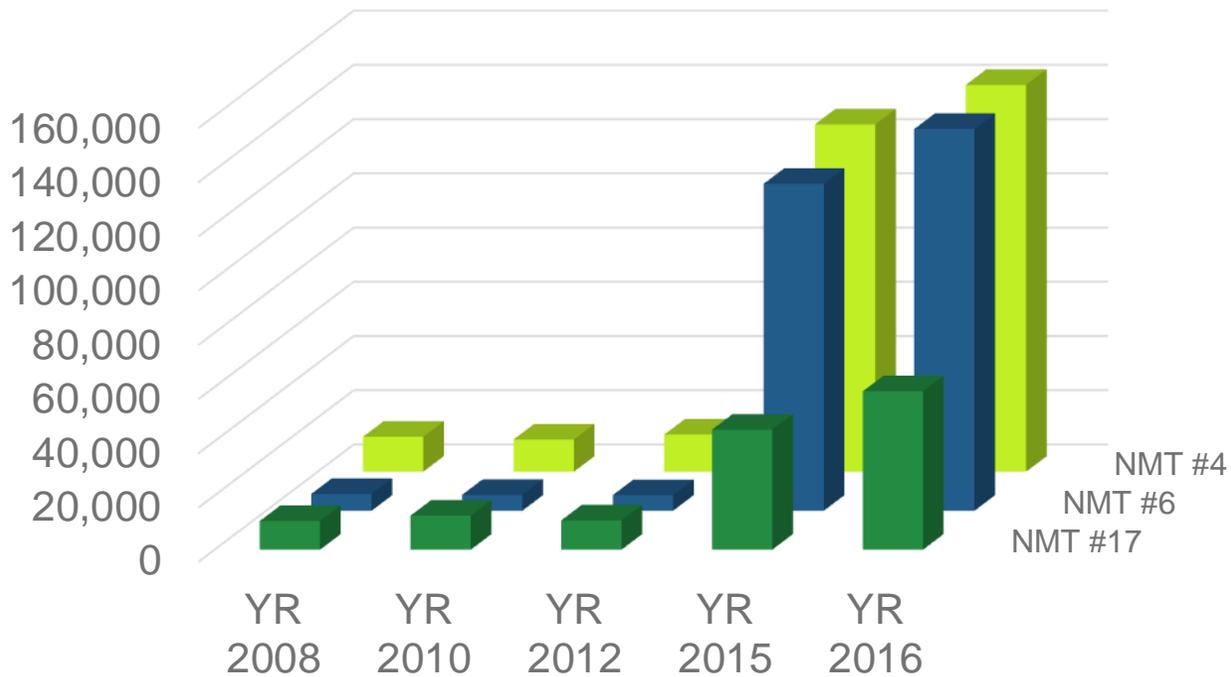


NOISE COMPLAINT ANALYSIS



NOISE MONITORING TERMINAL (NMT) DATA

NMT Event Counts



NMT DATA ANALYSIS

MONITOR	MWA ANNUAL "Aircraft DNL" (dB)							DNL change from 2010 to 2016
	YR 2010	YR 2011	YR 2012	YR 2013	YR 2014	YR 2015	YR 2016	
NMT #4	54.3	54.7	55.7	55.2	54.0	57.9	57.8	+3.5
NMT #5	53.3	57.4	54.4	54.2	54.2	58.6	58.5	+5.2
NMT #6	53.8	53.8	51.3	50.4	51.5	57.2	57.3	+3.5
NMT #7	59.9	59.7	59.7	59.7	60.1	61.1	60.6	+0.7
NMT #17	55.3	58.8	56.9	58.2	56.5	54.9	54.8	-0.5
NMT #20	44.9	46.4	44.6	44.7	43.8	43.5	43.8	-1.1

←-----Old Noise Monitors

New Monitoring System --→

NOISE MEASUREMENT RESULTS: DNL

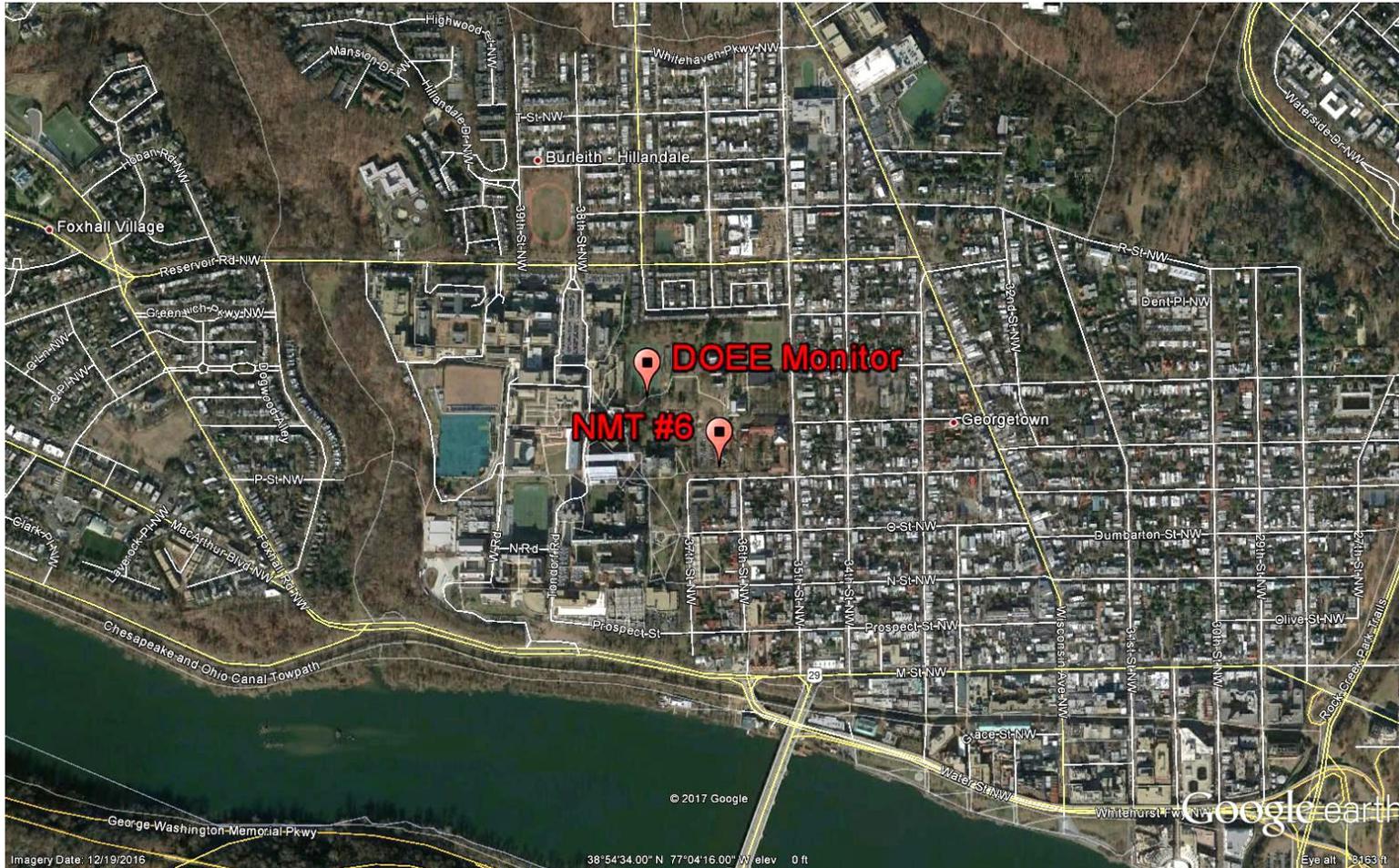
	Long Term: 6/13 – 7/12/17			
Phase 1 Location	North Flow	South Flow	Mixed Flow	Overall
R2: MacArthur Blvd.	59.3	56.2	59.0	58.0
R3: Hillandale	58.4	51.6	56.8	55.8

North Flow is 1 to 4 dBA louder than South Flow.

	Long Term: 6/19 – 7/17/18			
Phase 2 Location	North Flow	South Flow	Mixed Flow	Overall
L1: 47 th Street	61.2	57.0	60.9	60.2
L2: Charleston Terrace	60.7	57.7	60.3	59.9
L3: Georgetown Day	62.9	61.2	63.2	62.5
L4: Georgetown University	63.3	60.6	62.3	62.3
L5: Hillandale	58.2	52.5	57.3	56.8
L6: Reservoir Road	60.8	57.9	60.5	60.0

2018 was slightly louder than 2017.

NMT VS. DOEE MEASUREMENTS



DNL (dBA)		
MWAA	DOEE	Diff.
55.9	57.3	1.4

SLEEP INTERFERENCE STUDY: Awakenings

Residence	Location	Monitoring Period	Probability Awakened				NLR (dBA)
			Overall	North Flow	South Flow	Mixed	
R1	Reservoir Road	June 13 – 14, 2017	12.5%	-	-	-	30
R2	MacArthur Boulevard	June 13 – 14, 2017	34.3%	-	-	-	19
R3	Hillandale	June 13 – 14, 2017	30.9%	-	-	-	21
L1	47 th	June 20 – July 15, 2018	17.3%	18.2%	7.8%	28.5%	28
L2	Charleston Terrace	June 20 – July 15, 2018	32.4%	34.8%	23.5%	39.2%	21
L5	Hillandale	June 20 – July 15, 2018	20.7%	23.2%	8.7%	27.8%	24
L6	Reservoir Road	June 20 – July 15, 2018	13.0%	14.8%	4.5%	21.1%	31

CLASSROOM DISRUPTION

- 4 classrooms: Georgetown Univ., Georgetown Day, & Georgetown Visitation
- 1 to 7 days of measurements, unoccupied classrooms
- Numerous exceedances of ANSI S12.60 classroom noise criteria
 - Mainly during North Flow

NOISE MODELING

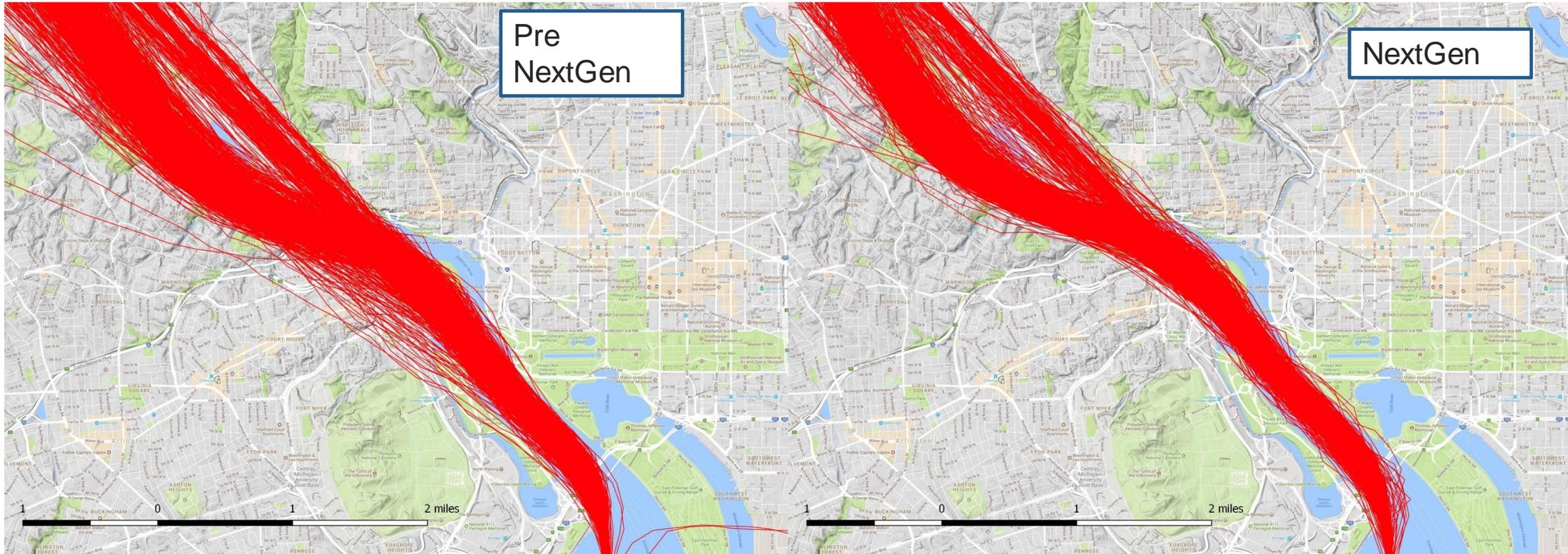
- FAA AEDT Noise Model v2c SP2
- Actual flight tracks (from NOP records)
- Models actual aircraft type, altitudes, operation time
- 8 days in 2010 (pre-NextGen), 8 days in 2015-2016 (NextGen)

DAYS MODELED

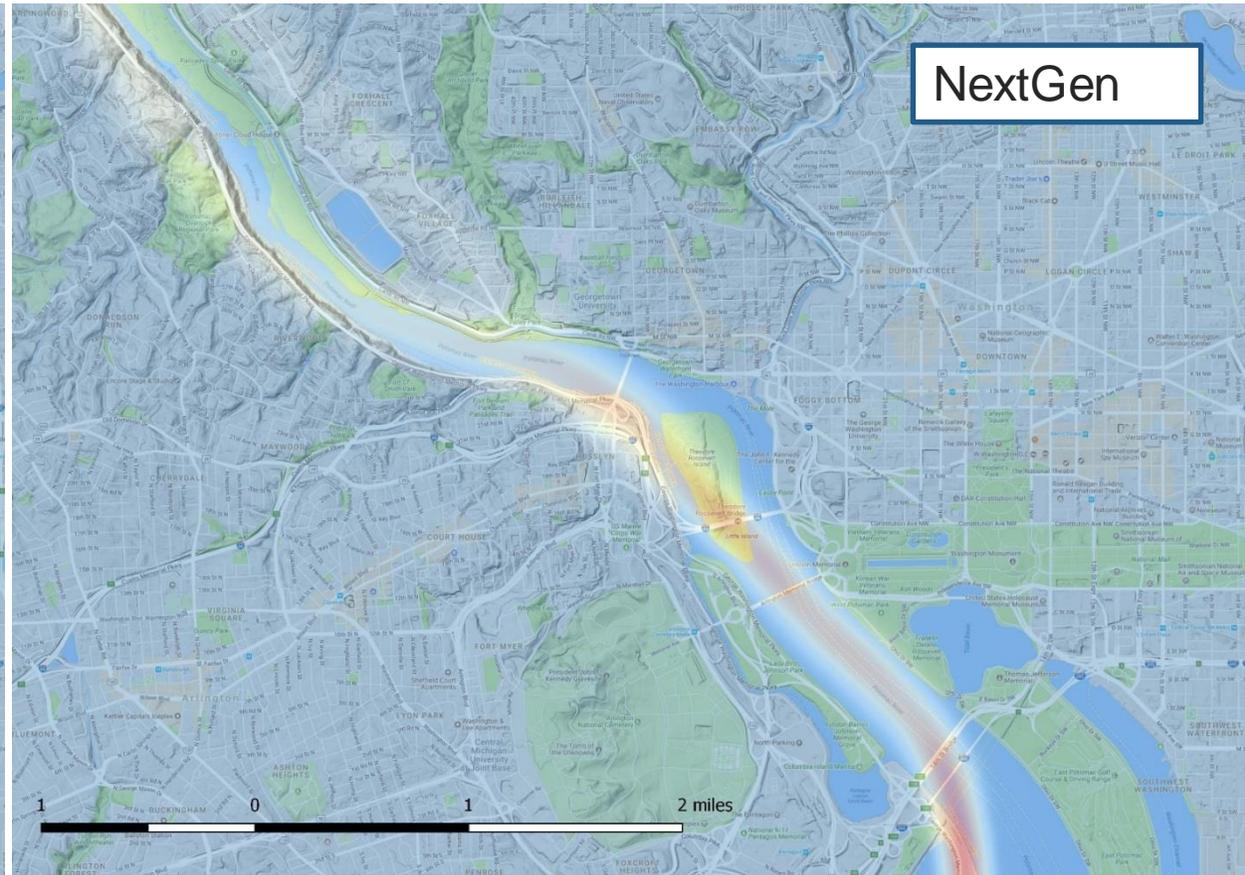
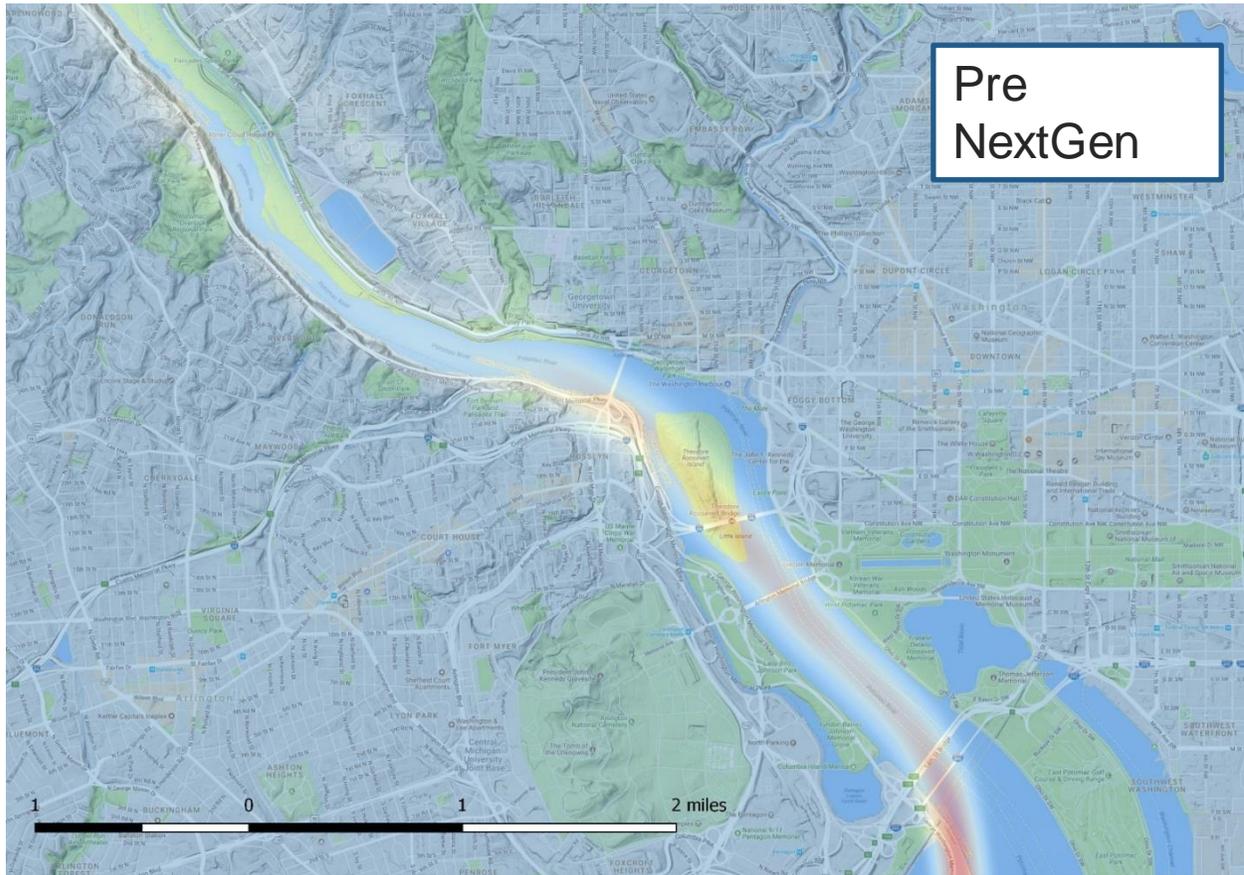
- 63% North Flow, typical for DCA

Modeled Day	Flow Direction
Wednesday, January 13, 2010	North
Thursday, March 25, 2010	South
Wednesday, April 28, 2010	North
Wednesday, June 16, 2010	South
Wednesday, July 21, 2010	North
Thursday, August 19, 2010	North
Wednesday, October 20, 2010	South
Tuesday, December 7, 2010	North
Tuesday, July 21, 2015	North
Wednesday, August 19, 2015	North
Thursday, October 9, 2015	South
Thursday, December 10, 2015	North
Wednesday, January 20, 2016	North
Tuesday, March 22, 2016	South
Thursday, April 28, 2016	North
Wednesday, June 1, 2016	South

ARRIVAL FLIGHT TRACKS

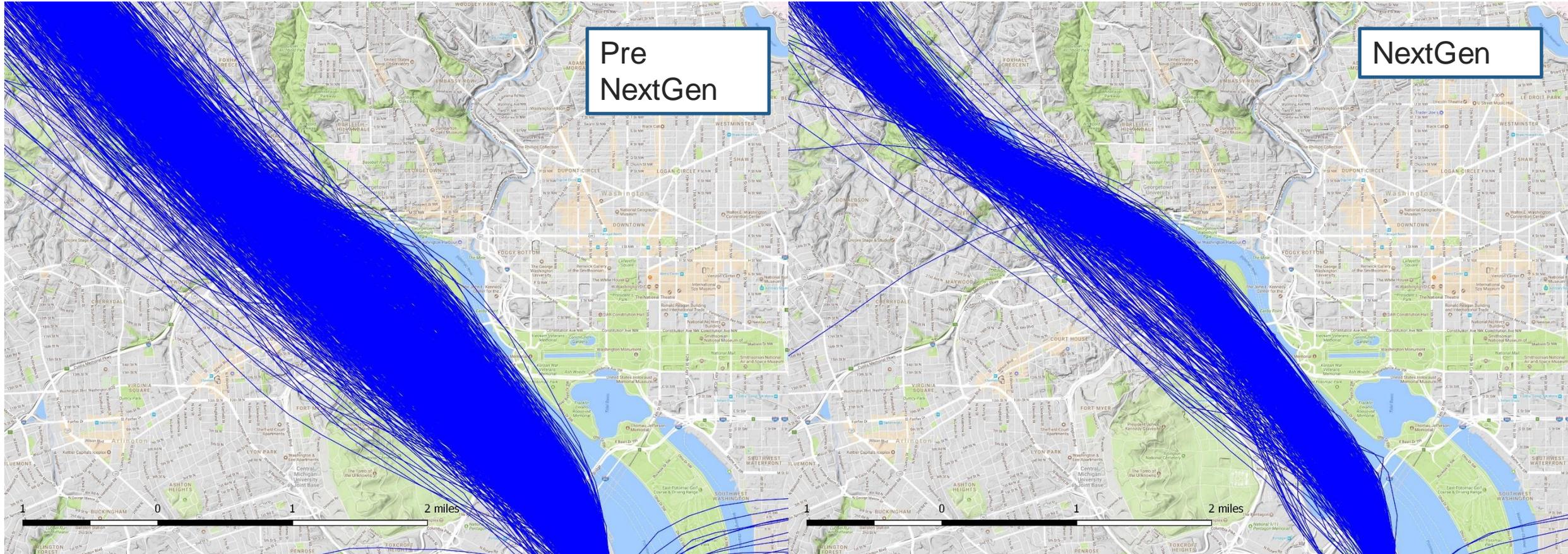


ARRIVAL FLIGHT TRACKS DENSITY

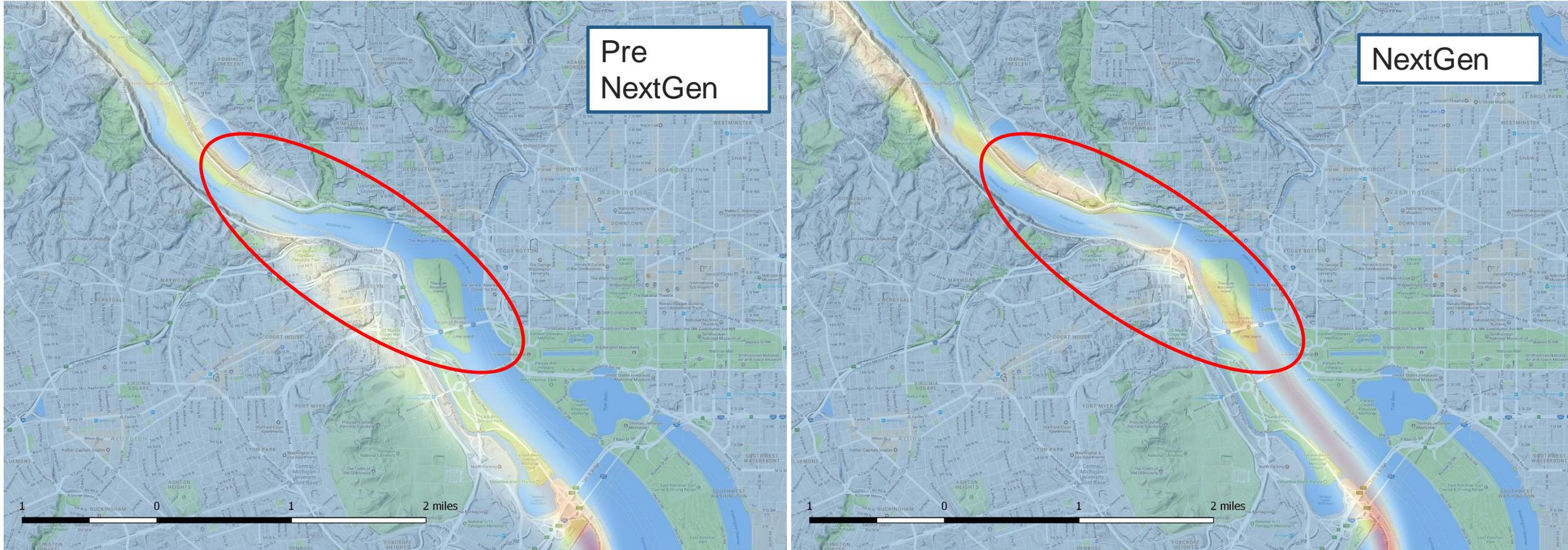


Warm Colors indicate higher density of flight paths. Flight paths averaged over 8 days

DEPARTURE FLIGHT TRACKS

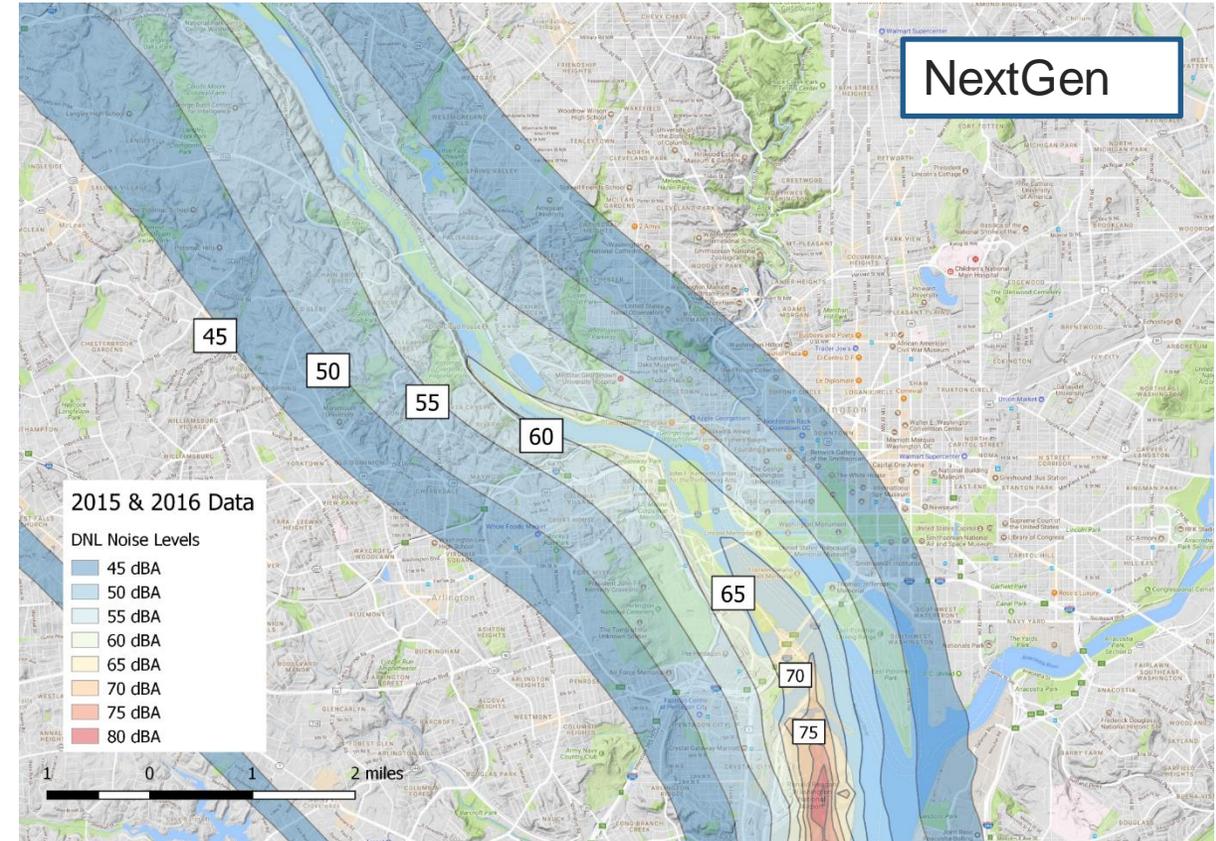
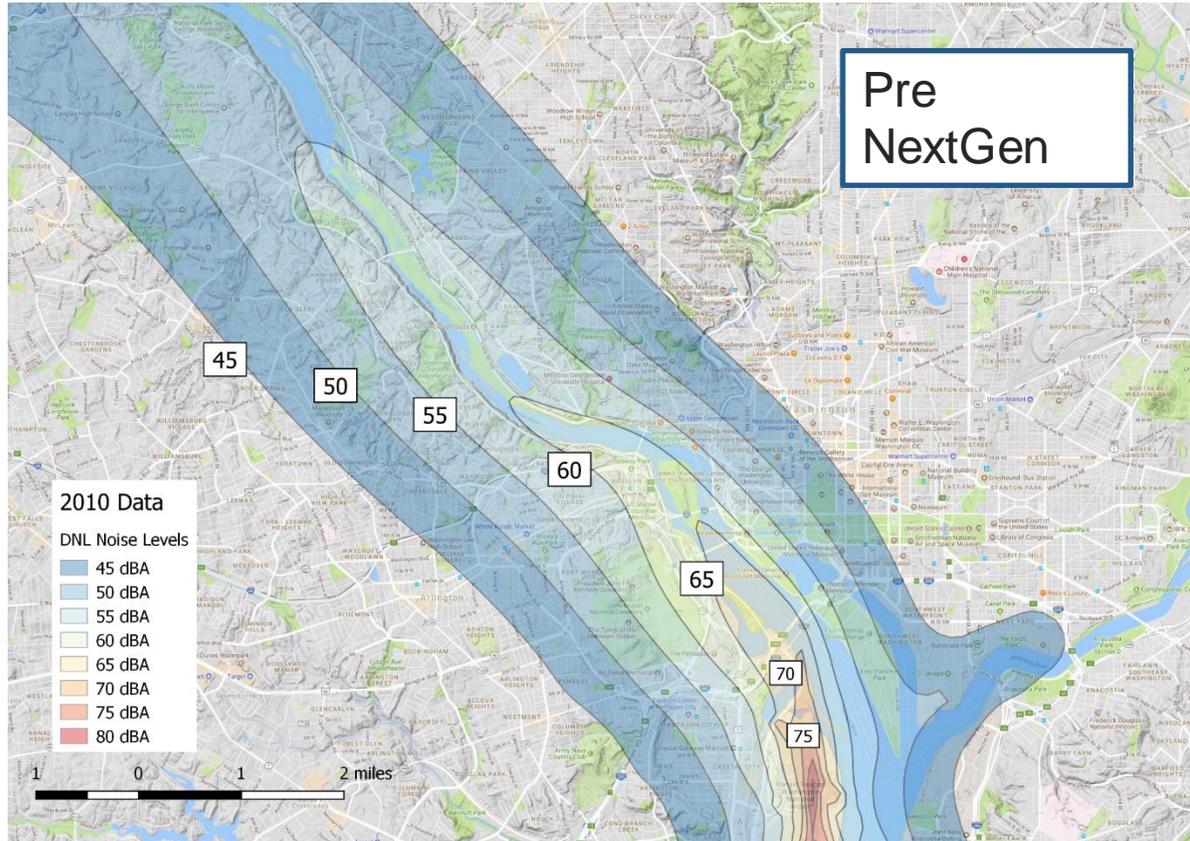


DEPARTURE FLIGHT TRACKS DENSITY



Warm Colors indicate higher density of flight paths. Flight paths averaged over 8 days

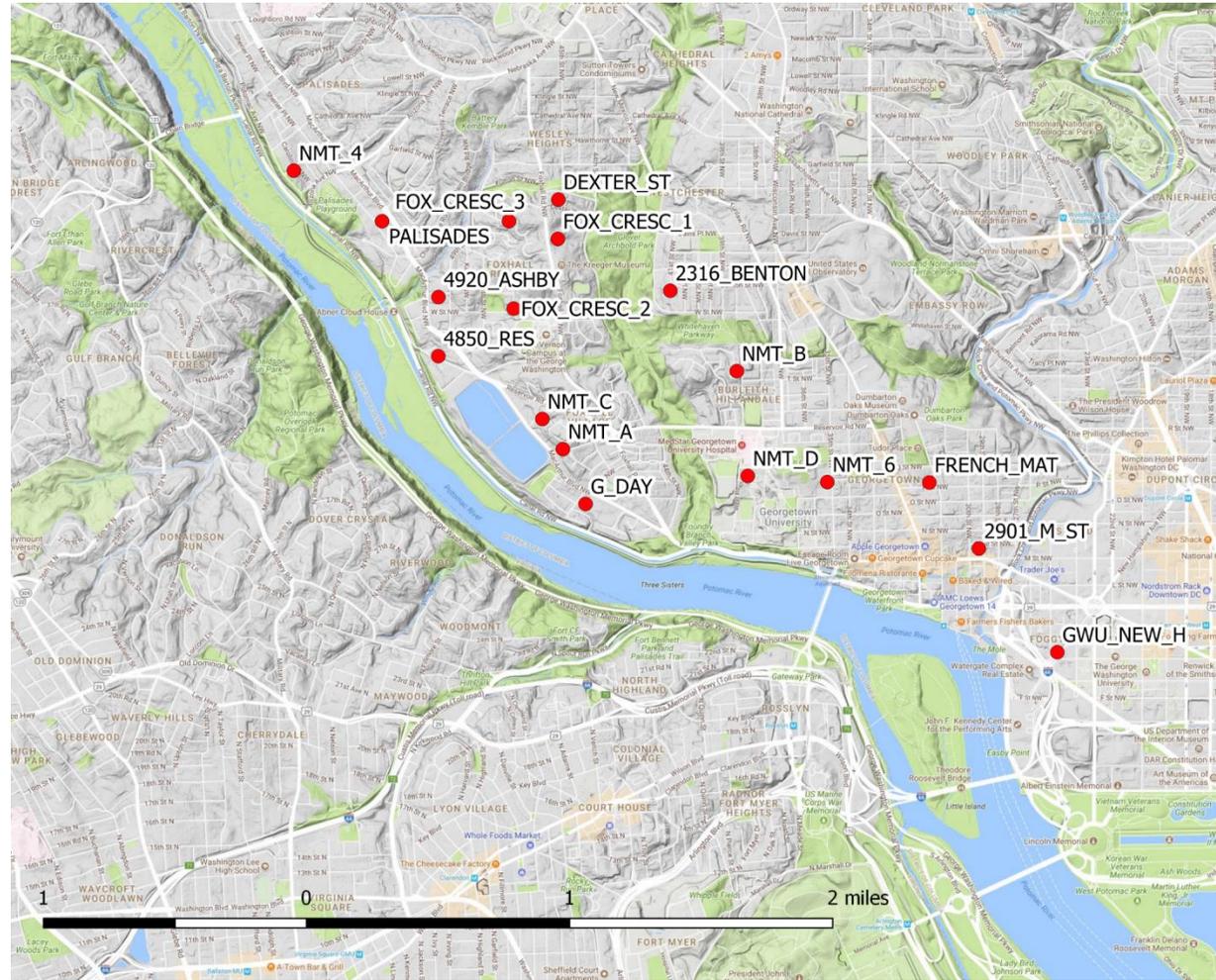
NOISE EXPOSURE CONTOURS (DNL)



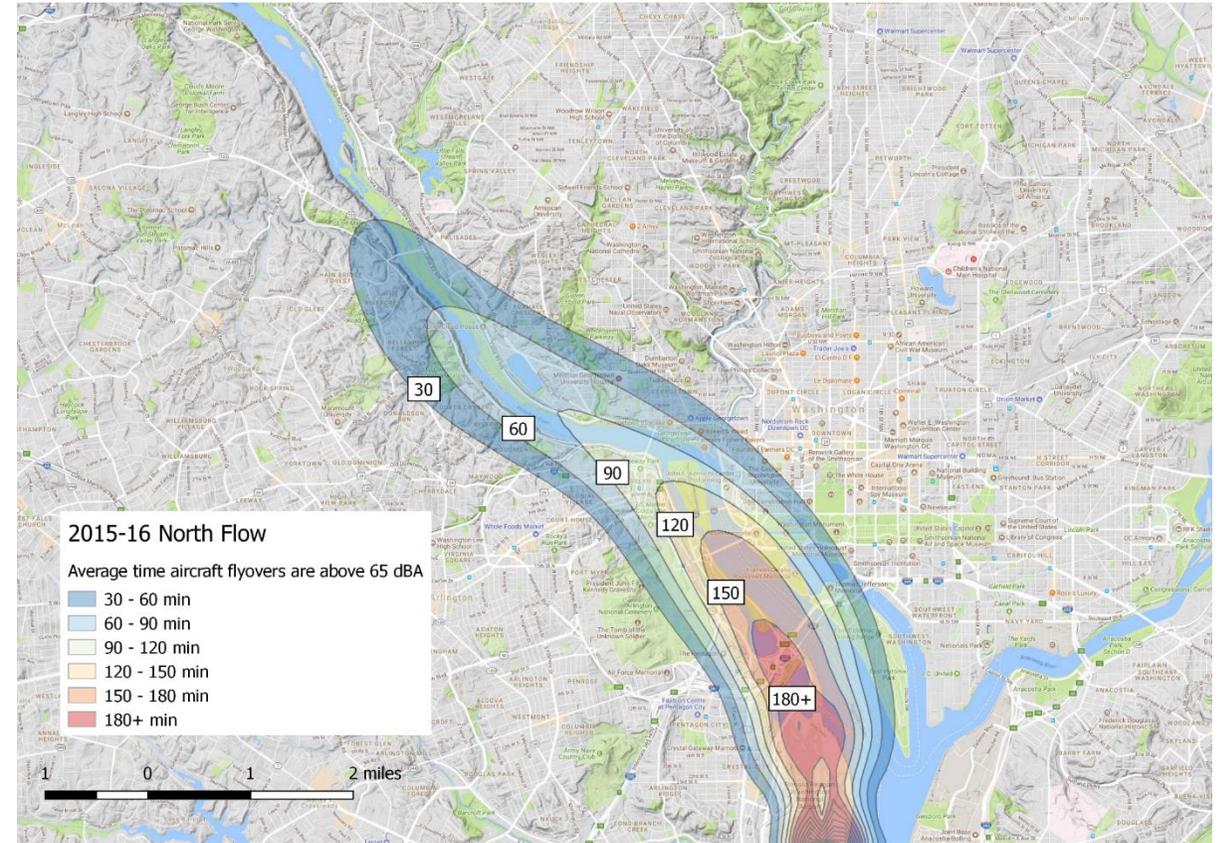
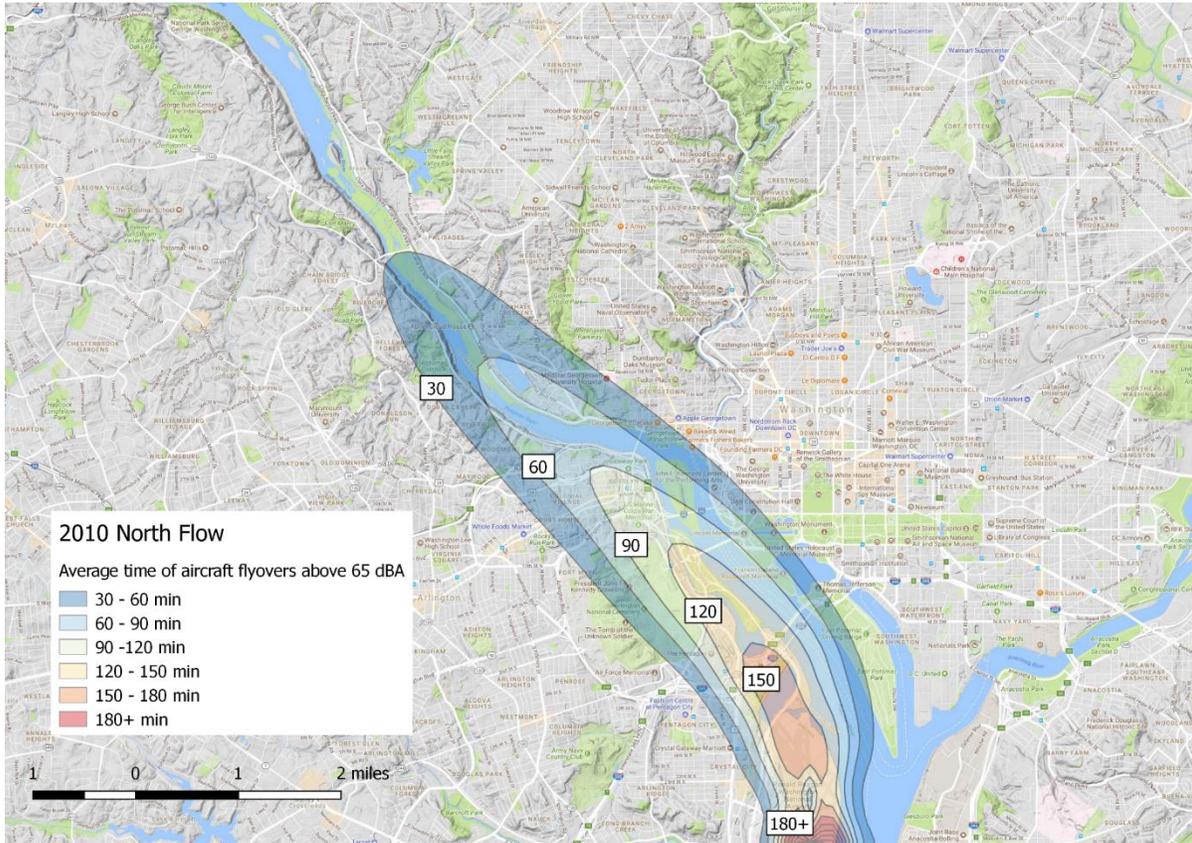
NOISE EXPOSURE CHANGE (DNL)

#	Name/Code	Pre NextGen	NextGen	Change
1	FOX_CRESC_1	54.3	54.2	-0.1
2	FOX_CRESC_2	57.2	56.9	-0.3
3	FOX_CRESC_3	55.1	54.7	-0.4
4	PALISADES	57.9	57.0	-0.9
5	2316_BENTON	52.7	53.6	0.7
6	2901_M_ST	53.0	55.0	2.0
7	DEXTER_ST	53.3	53.2	-0.1
8	NMT_4	58.2	57.5	-0.7
9	NMT_6	54.8	56.5	1.7
10	NMT_A	59.4	59.4	0.0
11	NMT_B	53.2	54.7	1.5
12	NMT_C	59.0	59.0	0.0
13	NMT_D	56.7	57.9	1.2
14	FRENCH_MAT	52.0	54.1	2.1
15	4850_RES	58.5	57.6	-0.9
16	4920_ASHBY	57.5	56.4	-1.1
17	G_DAY	59.7	59.6	-0.1
18	GWU_NEW_H	53.0	54.8	1.8

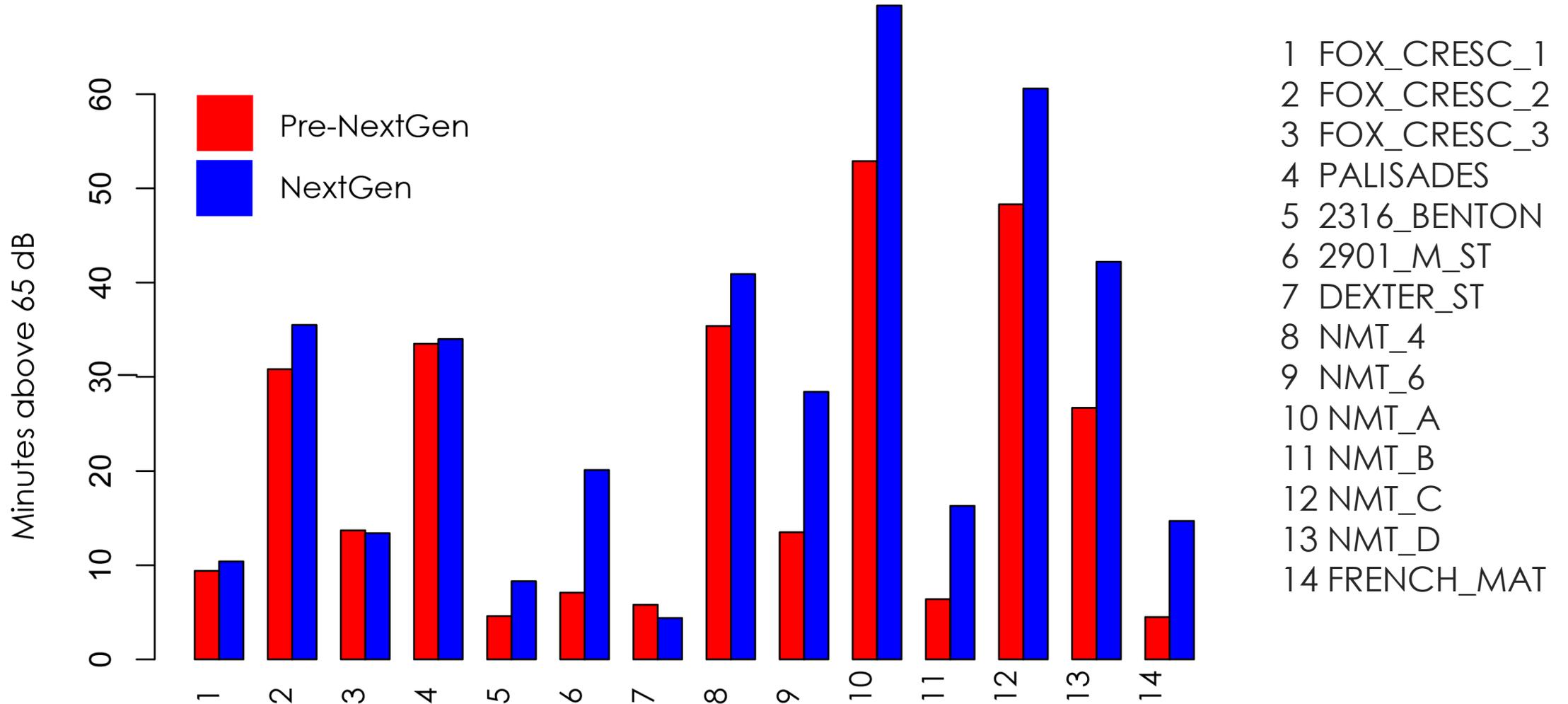
DNL Noise Level (dBA)	Significance Criteria
65+	1.5 dBA increase
60 to 65	3.0 dBA increase
45 to 60	5.0 dBA increase



TIME ABOVE LEVEL (MINUTES)

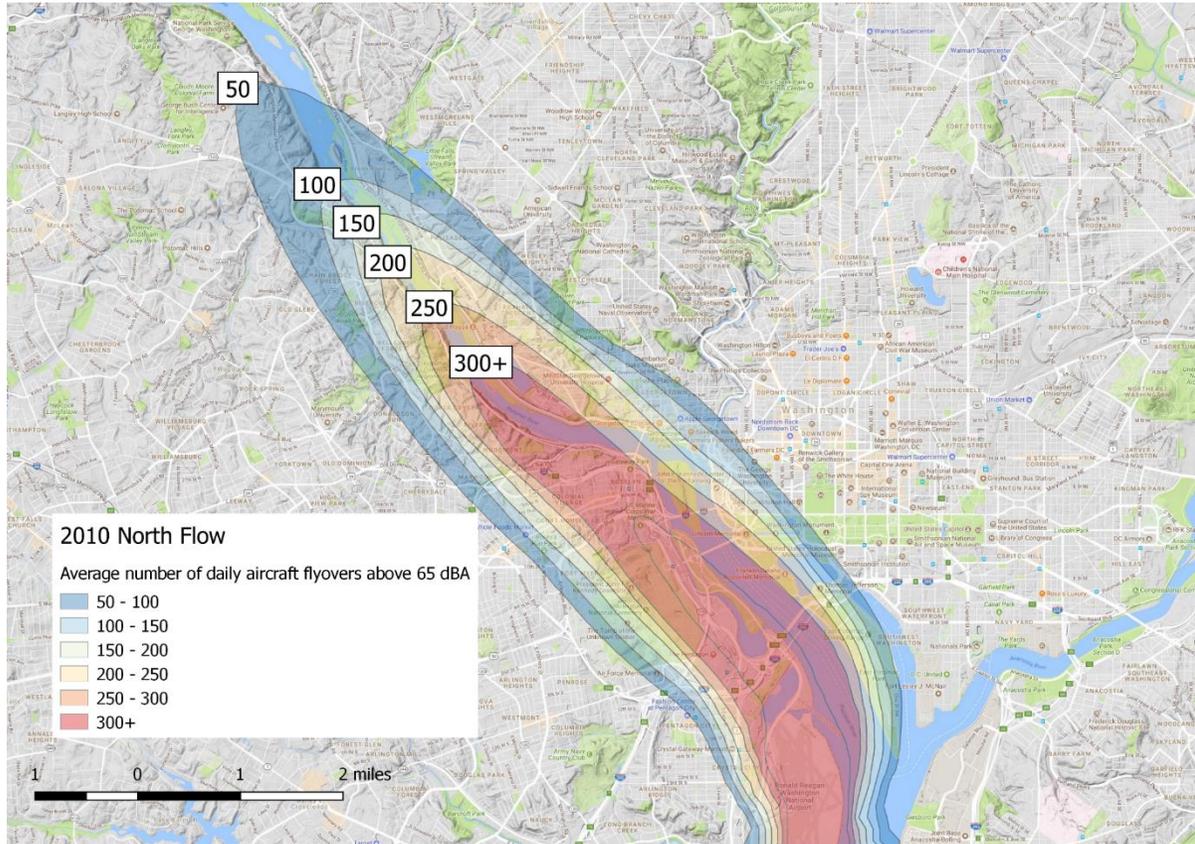


TIME ABOVE 65 dBA (MINUTES)

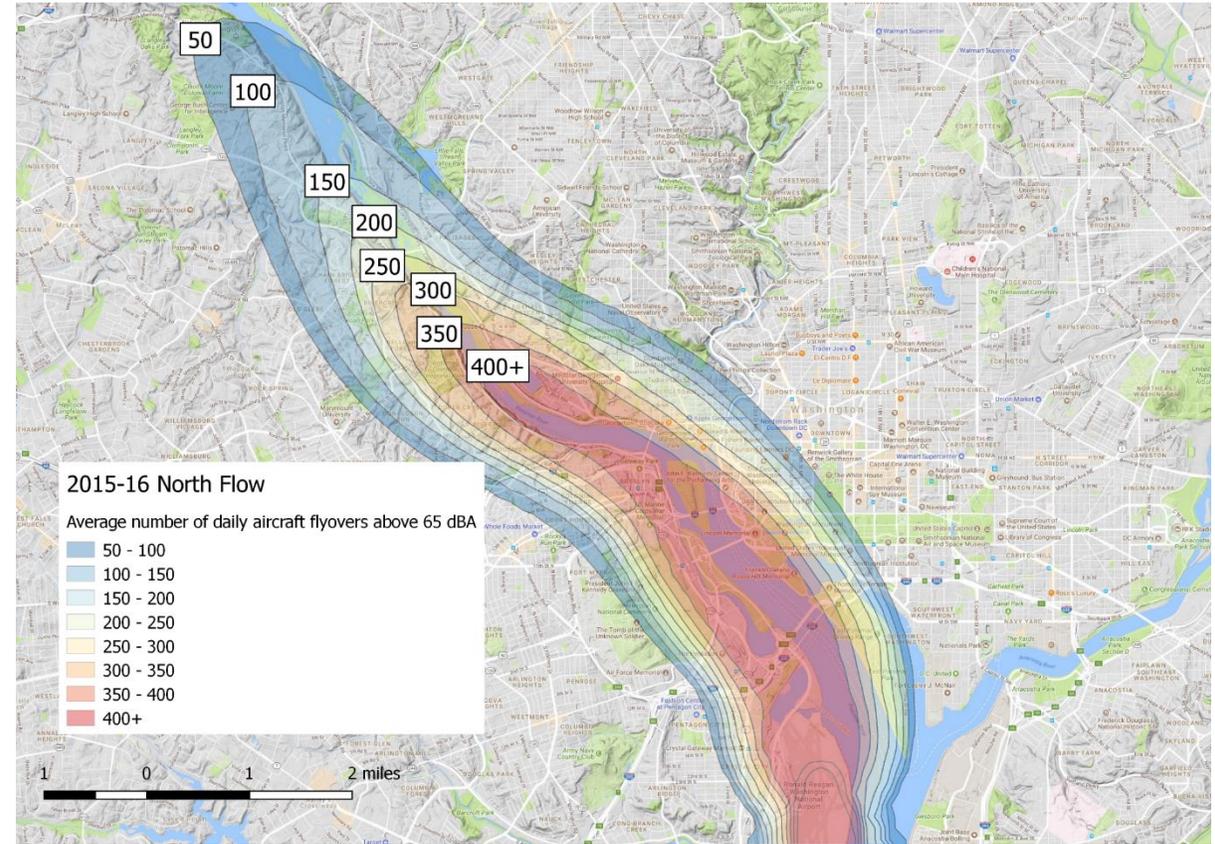


- 1 FOX_CRESC_1
- 2 FOX_CRESC_2
- 3 FOX_CRESC_3
- 4 PALISADES
- 5 2316_BENTON
- 6 2901_M_ST
- 7 DEXTER_ST
- 8 NMT_4
- 9 NMT_6
- 10 NMT_A
- 11 NMT_B
- 12 NMT_C
- 13 NMT_D
- 14 FRENCH_MAT

NUMBER ABOVE LEVEL (DAILY FLIGHTS)



2010: 300 flights/day above 65 dBA



2015-16: 400 flights/day above 65 dBA

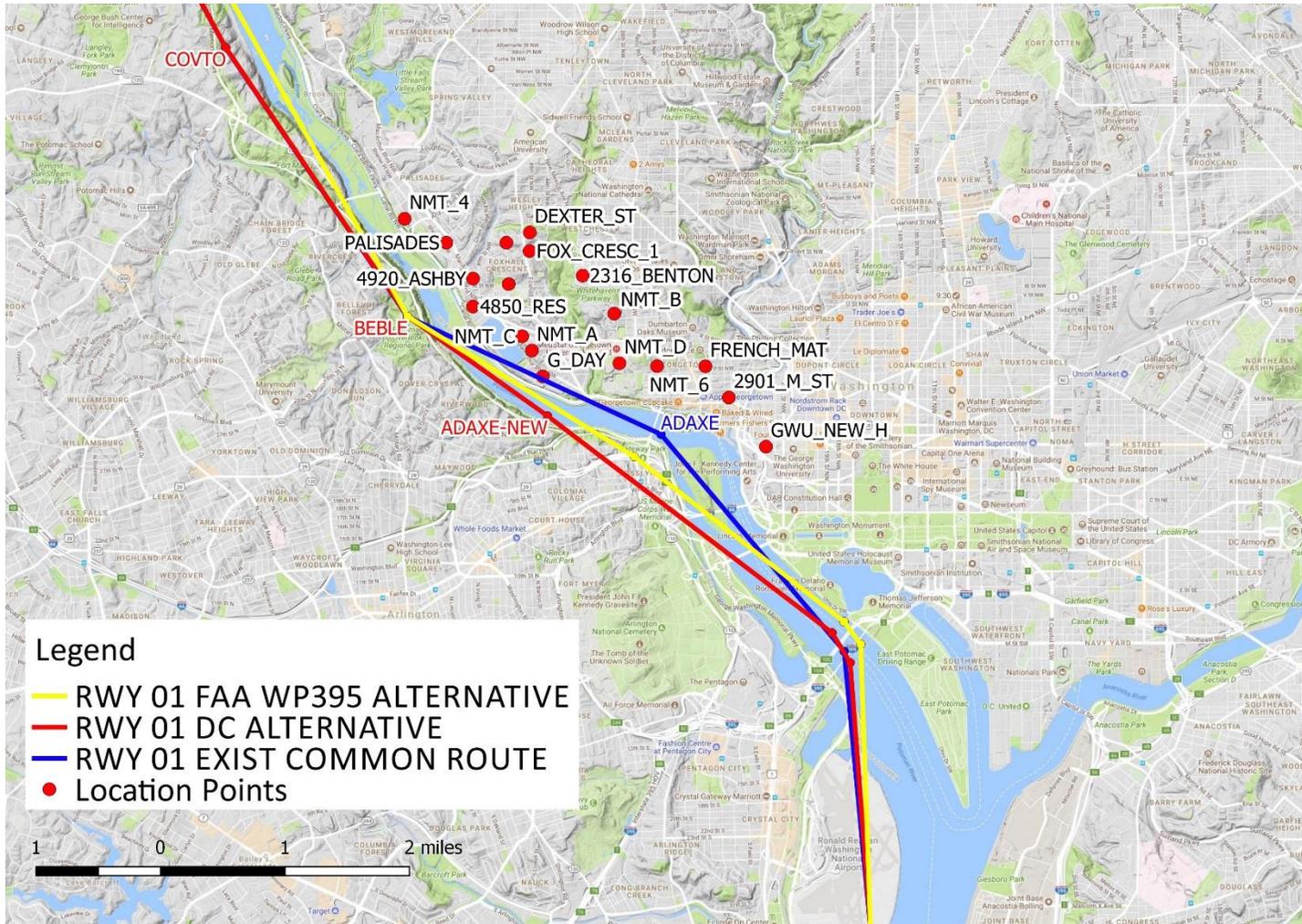
NOISE MODELING COMMENTS

- Calculated DNL similar to NMT data
- North versus South Flow contours produce similar DNL levels in NW DC, contrary to measurement data (1-4 dBA higher for North Flow)
- More research/analysis needed to determine modeling issues (by AEDT software authors)

OPTIONS FOR REDUCING NOISE EXPOSURE TO DC COMMUNITIES

- Modify RWY 01 departure track
- Evaluate higher departure altitudes
- Balance runway usage, “Preferential Runway Usage Program”
- Use RNAV approach procedures rather than River Visual
- Avoid low altitude arrival vectoring

RWY 01 DEPARTURE PATH ALTERNATIVES



#	Name/Code	Noise Reduction (dBA)	
		DC (2016)	FAA (2017)
1	FOX_CRESC_1	1.0	0.5
2	FOX_CRESC_2	0.8	0.4
3	FOX_CRESC_3	0.8	0.4
4	PALISADES	0.3	0.1
5	2316_BENTON	1.4	0.9
6	2901_M_ST	2.3	1.3
7	DEXTER_ST	0.9	0.5
8	NMT_4	0.1	-0.1
9	NMT_6	2.3	1.5
10	NMT_A	-0.3	-1.4
11	NMT_B	0.5	0.4
12	NMT_C	1.7	1.1
13	NMT_D	0.5	0.5
14	FRENCH_MAT	1.9	1.2
15	4850_RES	0.1	0.1
16	4920_ASHBY	0.2	0.1
17	G_DAY	0.2	0.2
18	GWU_NEW_H	2.4	1.1
	AVERAGE	1.0	0.5

PREFERENTIAL RUNWAY USE

- Winds <5 knots, use South Flow or balance North/South flow (currently defaults to North flow)
 - Especially during nighttime hours (10pm – 7am)
- Could result in average annual DNL reduction of 1 to 3 dBA for communities in the District

OTHER RECOMMENDATIONS

- Request new 14 CFR Part 150 Noise Planning Study
- MWAA/FAA to revise “Nighttime Program”
- Request MWAA to fund independent Subject Matter Expert (SME) for Working Group

CONTACT INFO

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Air Quality Division

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<https://doee.dc.gov/service/dca-airplane-noise-assessment-project>