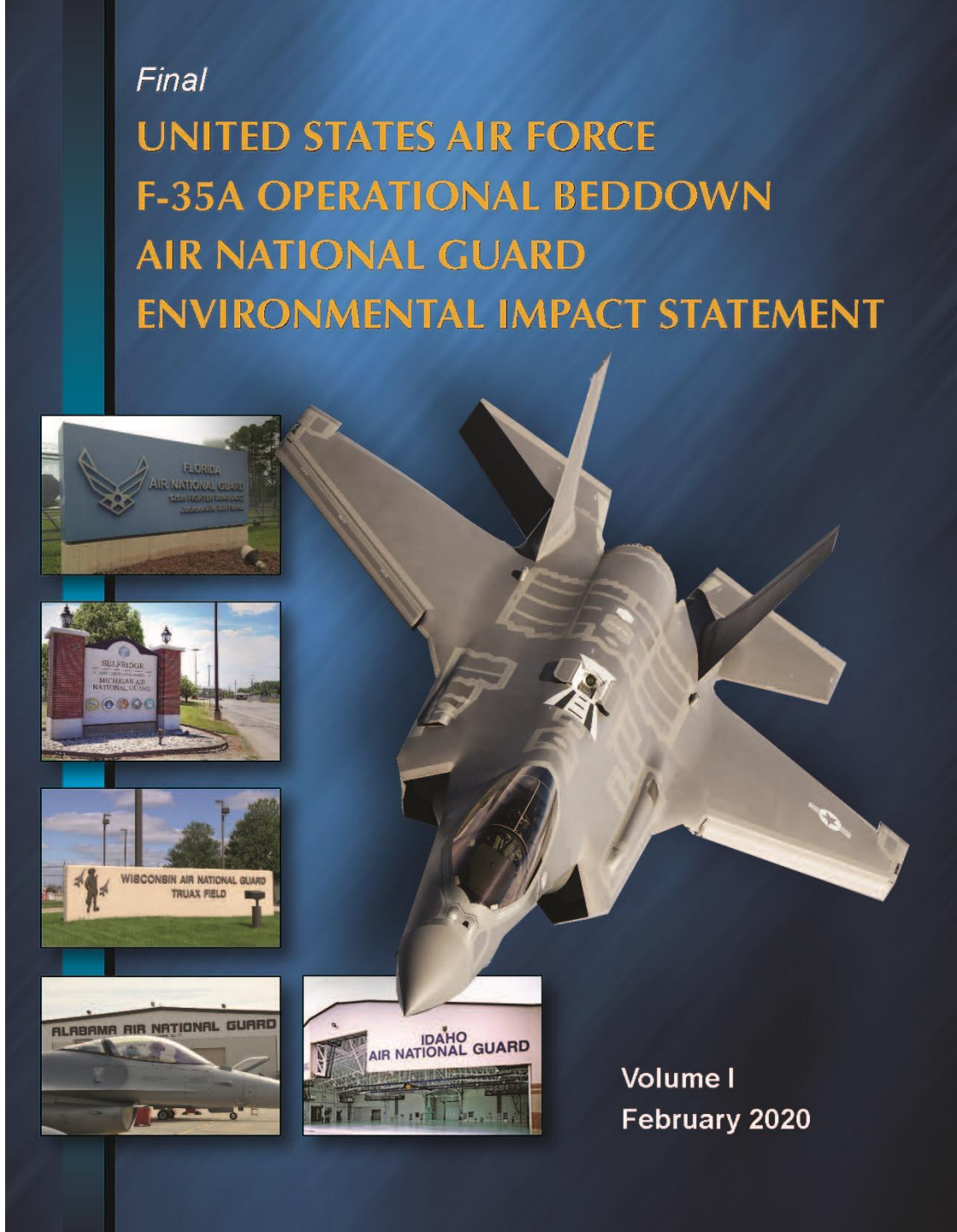
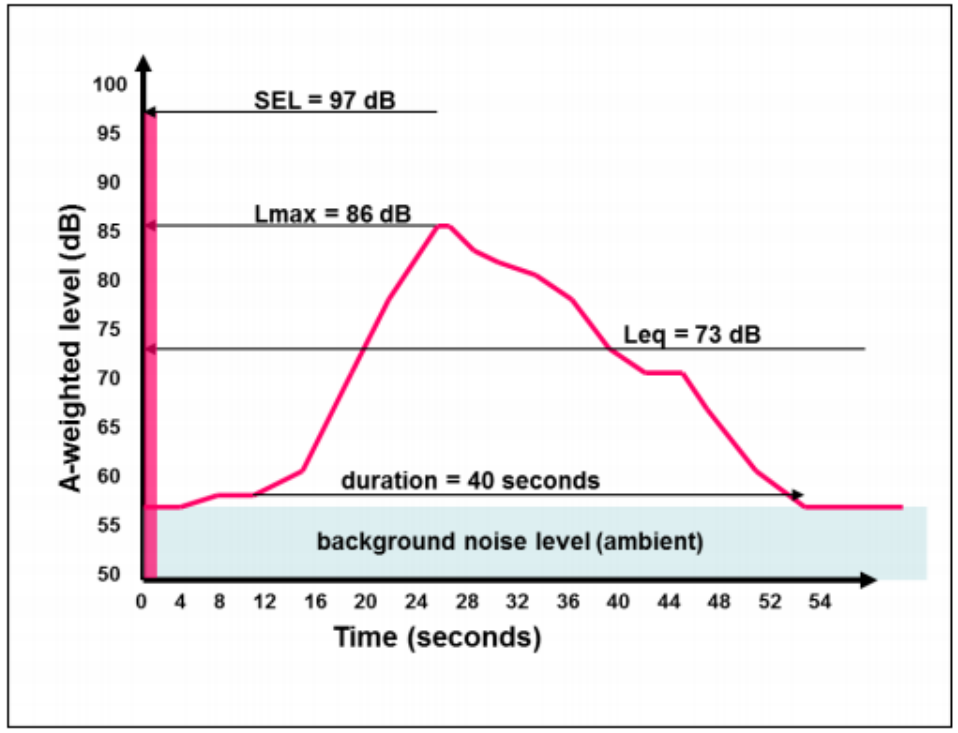
115th F-35 EIS Technical Summary of Findings



Sound Metrics

- DNL - Day Night Average Loudness
- SEL - Sound Exposure Level
- Lmax - Maximum instantaneous loudness



Source: Chicago Department of Aviation

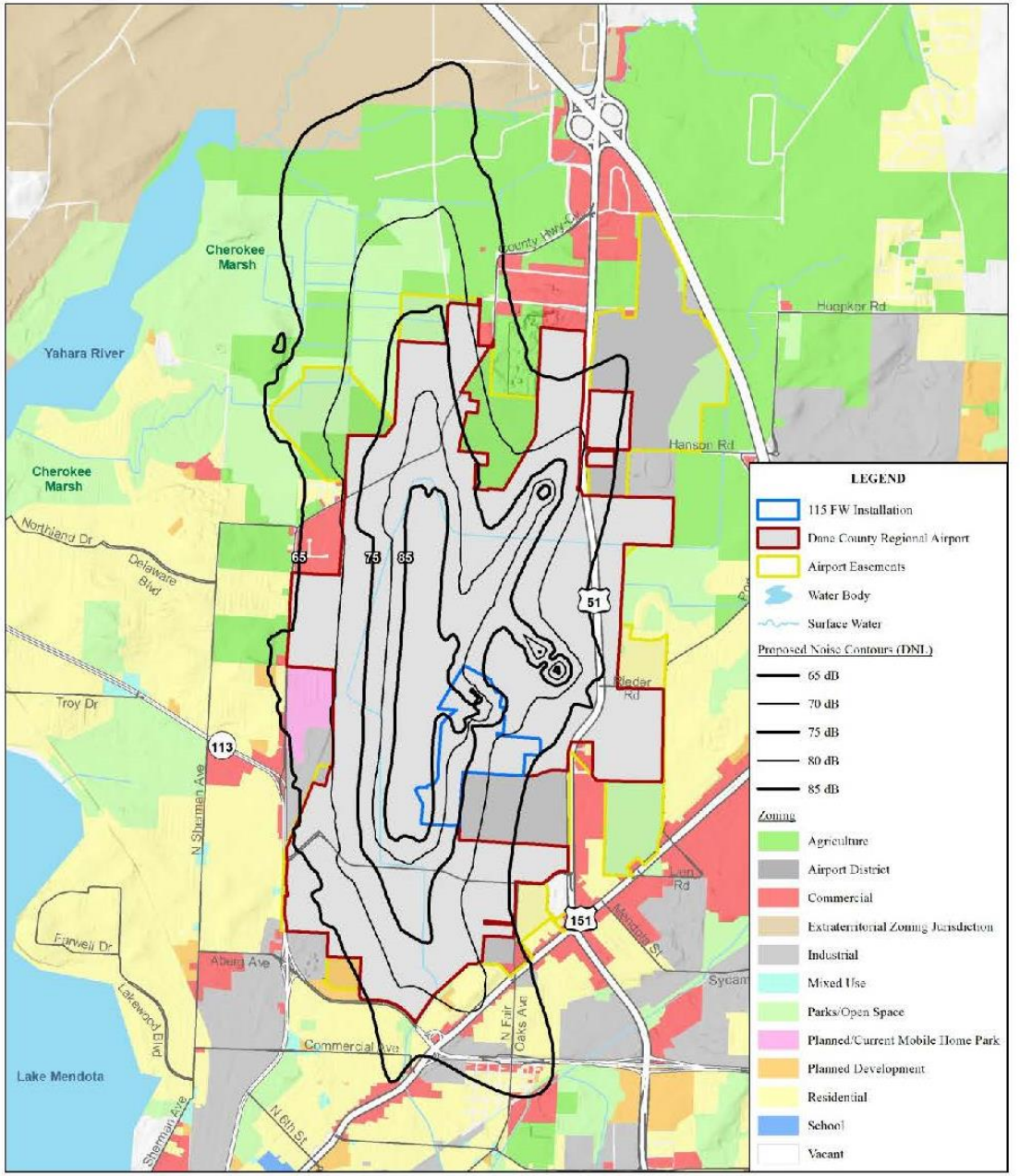


Figure WI3.5-2
Proposed DNL Noise Contours and Land Use within the Vicinity of Dane County Regional Airport

DNL Contour Modeling

Sound profiles of aircraft

+ **Quantify of flights** +

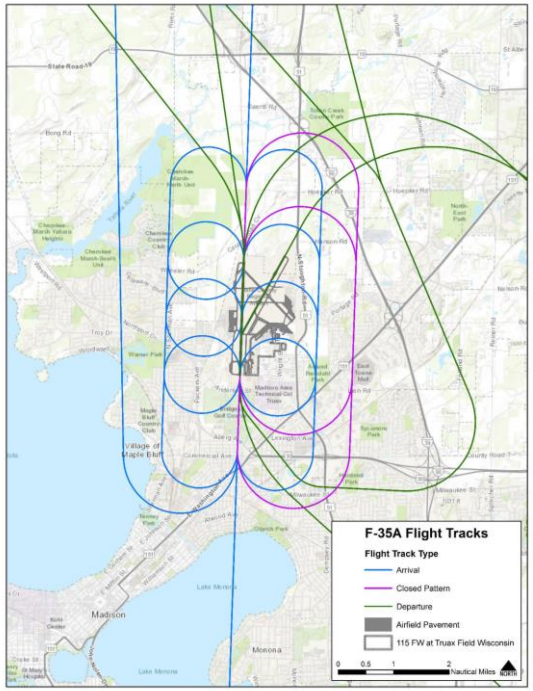
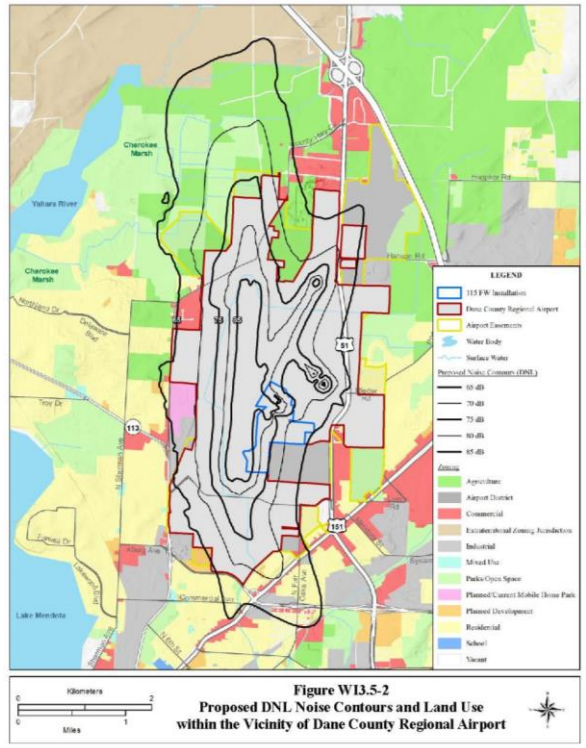
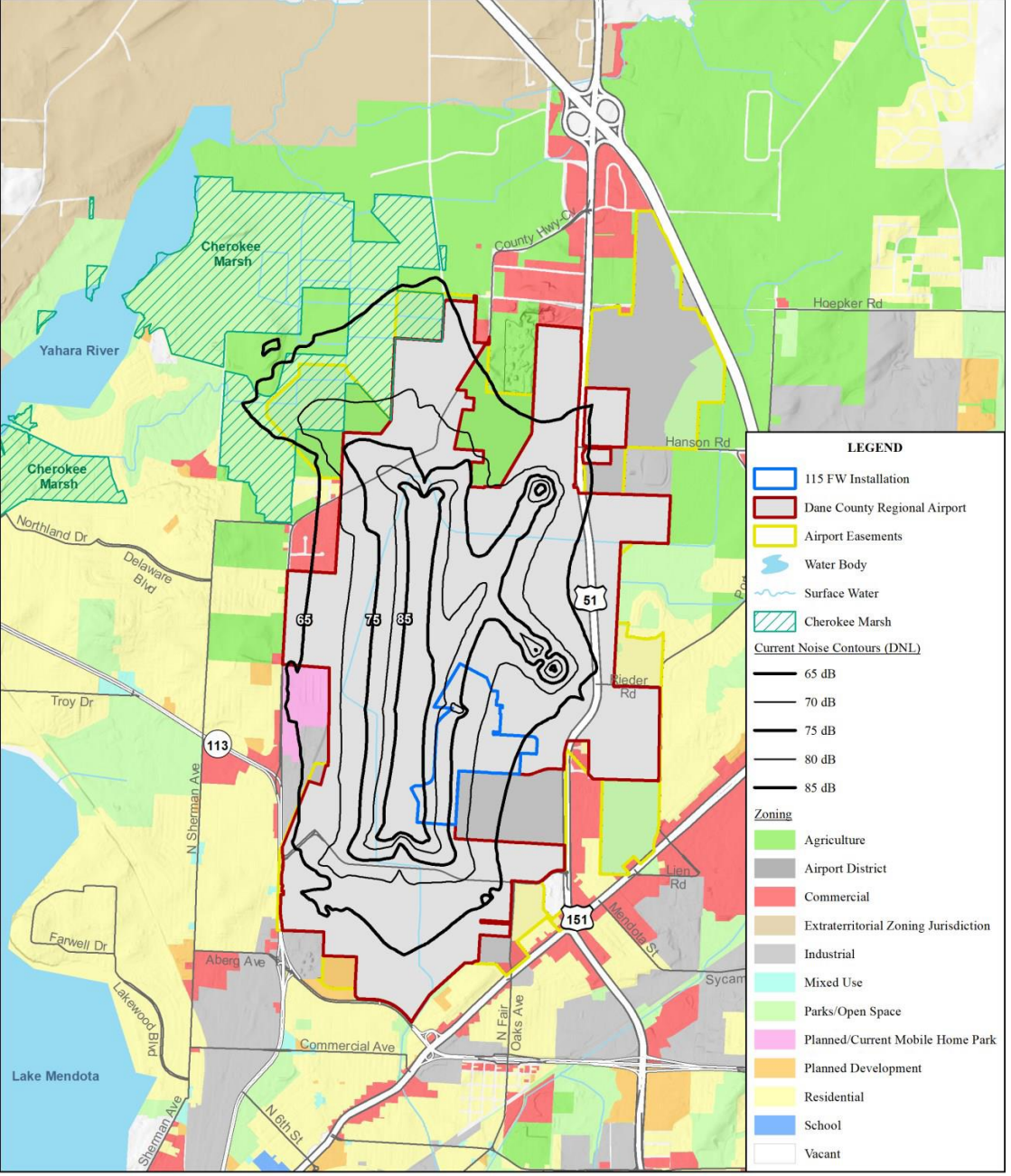


Figure A-12. Modeled Flight Tracks for F-35A at Truax Field

Flight paths

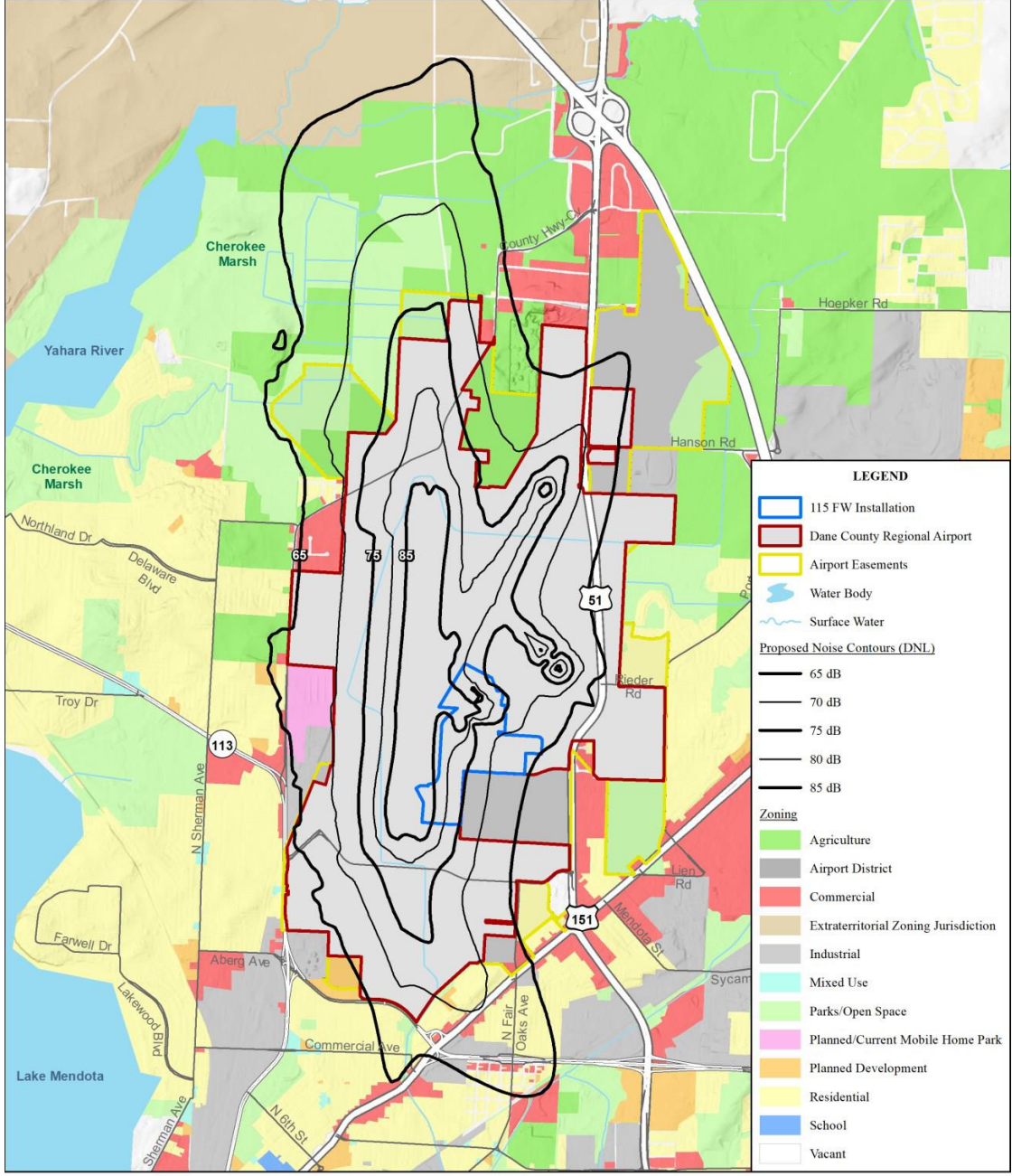
→





Kilometers
0 2
0 1
Miles

Modeled Existing Condition



Kilometers
0 2
0 1
Miles

Modeled F-35 contours

Sound Profiles of Aircraft

SEL – total sound energy

3 db considered threshold of differentiation

Most locations at or below threshold of differentiation

Largest 8 db difference – *not 4x loud*

Sound model includes afterburner for F-35 - *afterburner use not needed*

Table WI3.1-12. Loudest Events at Each POI, Measured in SEL – Proposed Action Alternative

Map ID	*Named Point of Interest*	*Current DNL*	*Current SEL (dBA)*	*Current Average Events Per Week (Daytime)*	*Current Average Events Per Week (Night)*	*Proposed Action DNL*	*Proposed Action SEL (dBA)*	*Proposed Action Average Events Per Week (Daytime)*	*Proposed Action Average Events Per Week (Night)*
1	Play Haven Child Care	56	95	3.6	0.1	56	98	0.7	0
2	Northside Kinder Care	62	105	0.1	0	64	106	0.6	0
3	Smartie Pants Early Learning Center (former)	55	98	0.1	0	56	98	0.1	0
4	UW Health at the American Center	52	100	1.8	0	53	100	1.8	0
5	Holy Transfiguration Orthodox Mission	53	97	0.1	0	55	97	0.1	0
6	Bashford United Methodist Church	55	100	0.1	0	58	101	0.1	0
7	Burke Lutheran Church	54	102	1.8	0	56	103	1.8	0
8	Ridgeway Church	61	107	5.4	0.1	70	114	7.4	0.2
9	Chapel of Faith Anglican Church	60	105	5.4	0.1	63	107	7.4	0.2
10	Lake View Elementary	58	100	0.1	0	57	100	0.1	0
11	Portage Road at Hoepker Road	53	103	1.8	0	56	105	1.8	0
12	Packers Avenue at Wheeler Road	62	105	6.7	0.1	64	105	0.7	0
13	Milwaukee Street at Farwell Street	56	100	0.1	0	60	104	0.8	0
14	The Richardson School	68	110	0.1	0	70	111	1.1	0
15	Madison Baptist Academy	57	97	3.6	0.1	58	97	0.5	0
16	Quincy Avenue and Carpenter Street	62	108	5.4	0.1	71	116	7.4	0.2

Legend: dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = Point of Interest; SEL = Sound Exposure Level.

WI-35

"For this Proposed Action, **the USAF has evaluated the requirement for F-35A afterburner use during a departure at each of the five alternative installations based on a basic training configuration, airfield elevation, runway length, and hottest temperature on record. The evaluation resulted in minimal to no requirement for afterburner use** at any of the installations under consideration. There is no training requirement for F-35A pilots to utilize afterburner on take-offs. Although **heavily-loaded F-35A training flights may drive afterburner use in rare cases, that training scenario would typically occur off-station**, and would not be required at any of the five ANG alternative installations." (Final EIS – pg. 2-6)

Quantity of flights

- Modeled based on 47% increase in military flights
  - 27% increase based on flying hour program assumptions, intended to ensure all bases considered are compared equally
  - Does not account for current off-base operations which reduce take offs and landings at Truax (Volk Field, Milwaukee 128th Air Refueling Wing)
  - 20% increase based on maintaining alert mission while transitioning to F-35 (temporary increase)
  - No additional pilots, no additional aircraft

Table 2.2-2. Current and Estimated Proposed Annual Home Field Airfield Sorties

ANG Unit and Airfield	*Total Current Annual Legacy Aircraft Sorties*	*Proposed F-35A Sorties*
115 FW, Wisconsin	2,400	3,061
124 FW, Idaho	2,500	3,061
125 FW, Florida	2,400	3,061
127 WG, Michigan	2,388	3,061
187 FW, Alabama	3,076	3,061

Legend: 115 FW = 115th Fighter Wing; 124 FW = 124th Fighter Wing; 125 FW = 125th Fighter Wing; 127 WG = 127th Wing; 187 FW = 187th Fighter Wing.

Source: ANG 2018.

"Based on a **4,500 flying hour program, and an average sortie duration of 1.47 hours**, the National Guard Bureau (NGB) anticipates that each ANG F-35A unit would fly no more than an estimated 3,061 sorties annually. Each sortie includes at least one departure and one arrival resulting in a potential 6,122 annual airfield operations. Additional airfield operations would occur as a result of additional practice approaches to the airfield. **The EIS assumed that 100 percent of air operations would be at home station** to provide a conservative estimate for the initial F-35A qualification training required for ANG pilots." (Final EIS pg 2-4)

DNL & FAA Part 150 Noise Compatibility Program

FAA advisory recommendations for land use surrounding airports

65 db threshold for mitigation funding through FAA

DNL contour determines types of mitigation strategies which can be applied. For example:

- 68 db - soundproofing for SF
- 76 db - relocation or easement sf
- Mobile homes not eligible for soundproofing

Airport applies for Part 150 funds

Table 3.6-1. Land Use Compatibility with Yearly Day-Night Average Sound Levels

Land Use	*<65 dB DNL*	*65-70 dB DNL*	*70-75 dB DNL*	*75-80 dB DNL*	*80-85 dB DNL*	*>85 dB DNL*
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail - building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade - general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Inside DNL Contours

		Day Night Average Noise Levels					
		Current			Proposed		
Residential Units		65-70 db	70-75 db	75-80 db	65-70 db	70-75 db	75-80 db
Not compatible		312			312		
Conditionally compatible					1,025	142	
Employees		4,498	936		8,299	2,737	589
Zoning Districts (acres)							
Residential	TR-C1				52.3	14.4	
	TR-C2				17.6		
	TR-C4				14.1	0.7	
	TR-V1				27.8	7.0	
	TR-V2				7.4		
	SR-C3					0.6	
	SR-V1				14.6	0.3	
	SR-V2				16.7	2.2	
	PMHP	44.7			59.3	0.9	
Commercial, Employment	CC-T				33.0	0.2	
	SE	64.5	34.3		78.8	44.0	11.7
	IL	80.0	14.5		169.7	30.2	0.3
	TE				22.7		
Special	AP	215.9	266.3	290.9	172.6	217.5	269.4
	CI	19.3	12.7	0.2	27.5	10.9	
	PD				6.9	3.2	
Open Spaces	A	9.9			29.2	0.2	
	PR	153.0	27.3		157.2	141.9	52.8
	CN	0.1		9.5	13.0	6.4	

Compatible

Compatible with noise level reduction techniques integrated into building design

Where the land use must be allowed, noise level reductions of 25-30 db should be incorporated

Not compatible

PD districts in this area are predominately commercial and office, however approximately 4 acres of residential are included in the Carpenter Ridgeway area

Notes: Residential unit count based on City of Madison parcel data, using parcel centroid and sound curves

Employment counts from Census OnTheMap, 2015 data, all jobs

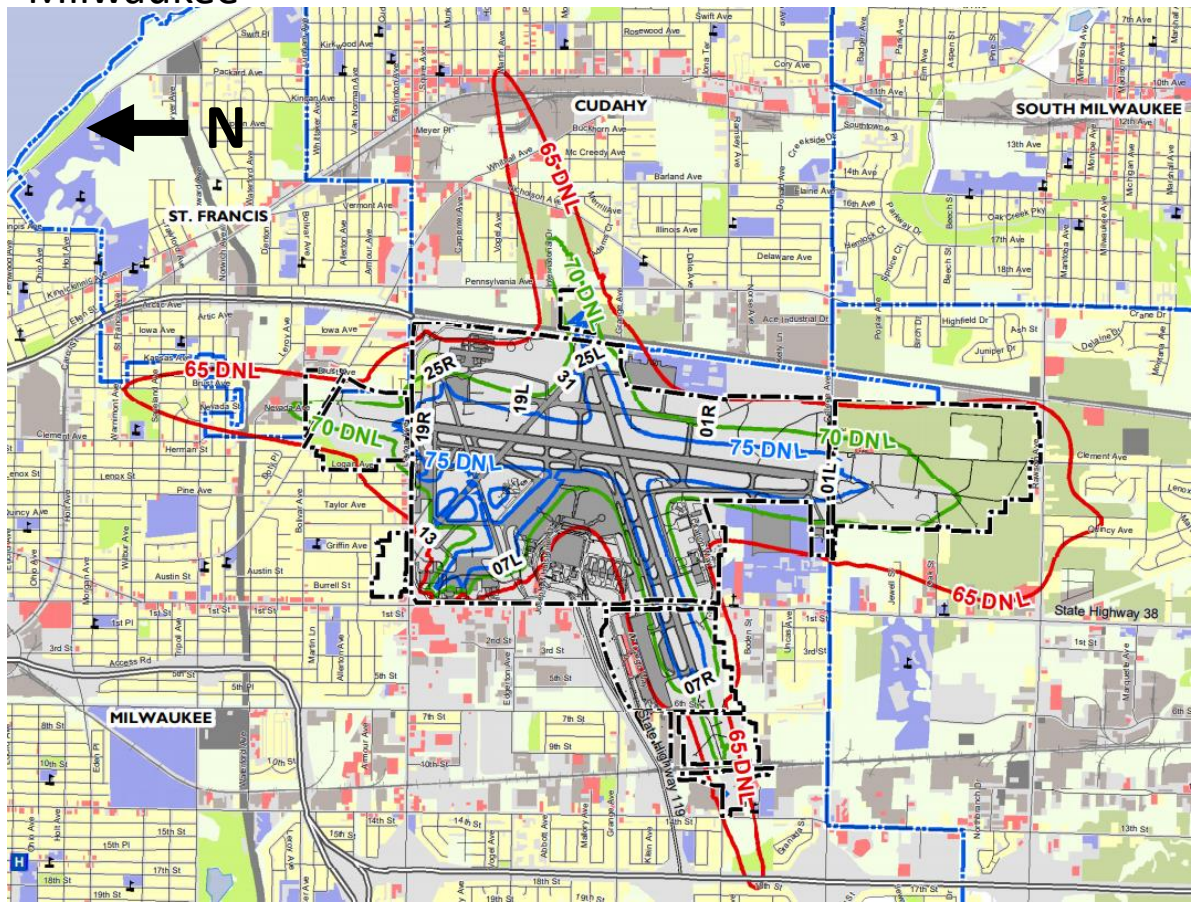
Chart from draft EIS analysis - September 2019.
Minor changes may have occurred since creation

Land Use in DNL Contours in Region

Residential is common in 65 db DNL contours

Not compatible does not mean uninhabitable

Milwaukee



Minneapolis St. Paul

MSP 2019 Annual Noise Contour Report — Metropolitan Airports Commission

Table 2.5 contains the count of single-family (one to three units per structure) and multi-family (more than three units per structure) dwelling units in the 2019 Actual Contour. The counts are based on the block-intersect methodology where all structures on a block that located within or touched by the noise contour are counted. The spatial analysis was performed in Universal Transverse Mercator (UTM Zone 15).

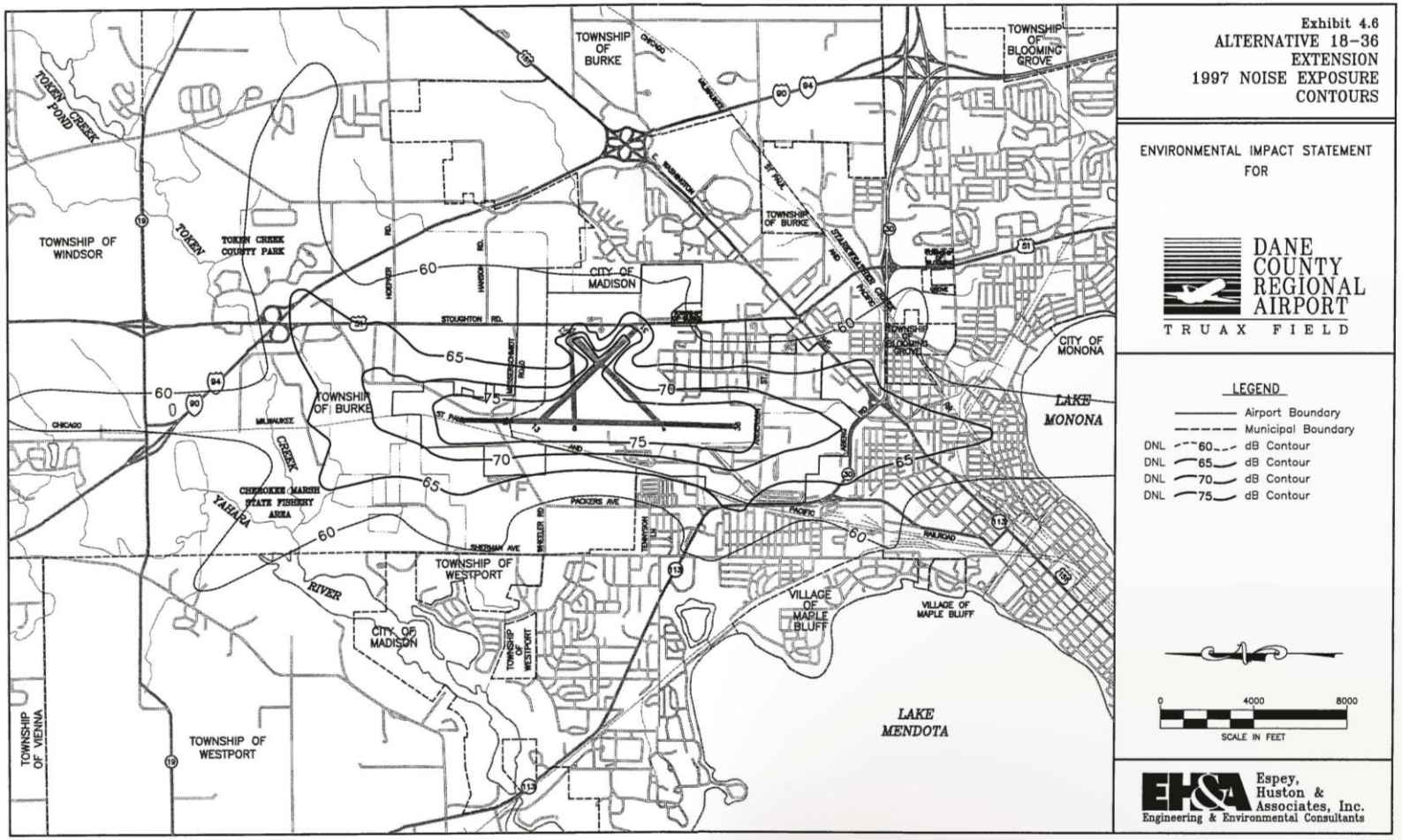
Table 2.4 Summary of 2019 Actual DNL Noise Contour Unit Counts

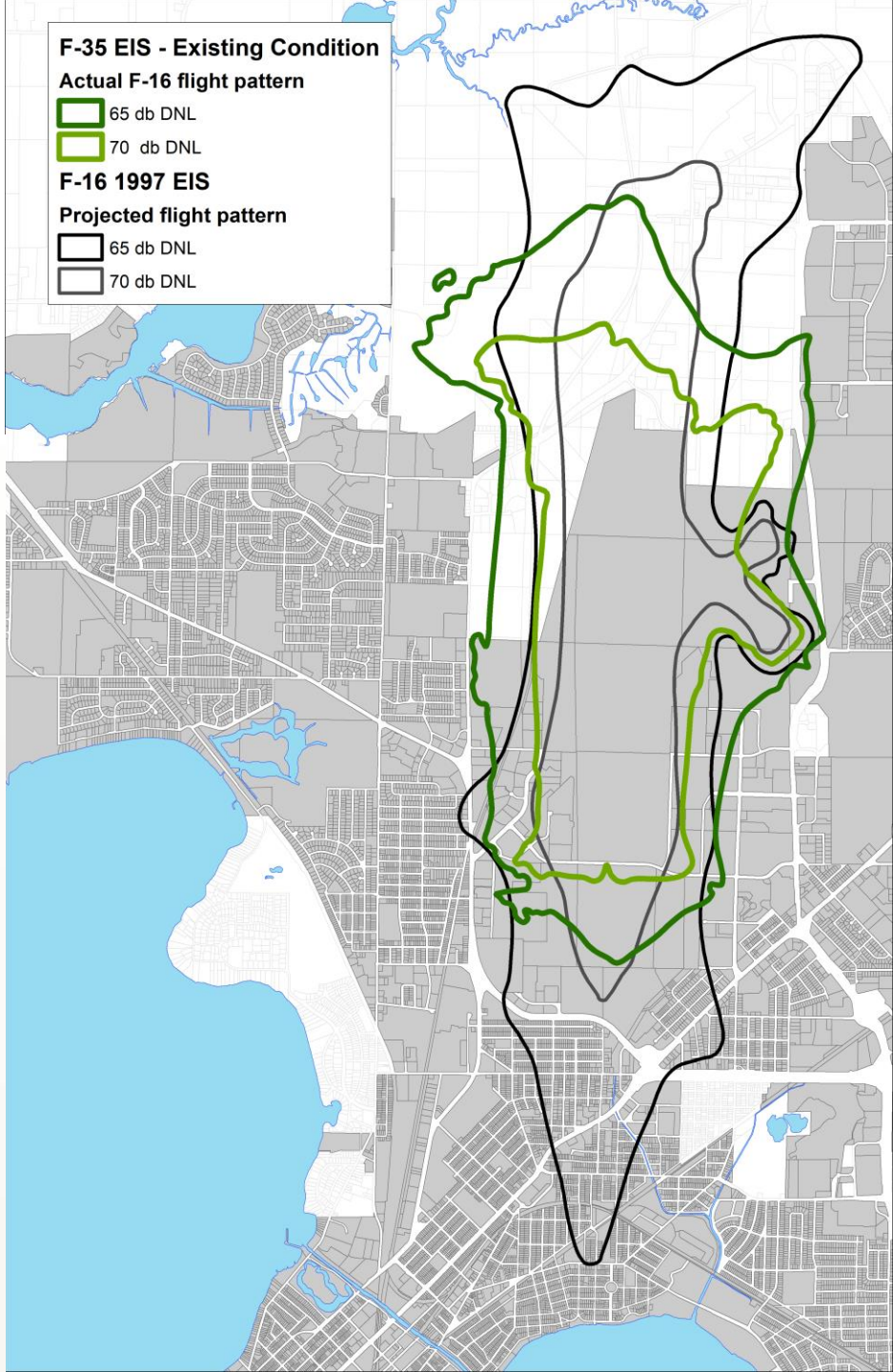
	Dwelling Units Within dB DNL Interval									
	Single Family					Multi-Family				
City	60-64	65-69	70-74	75+	Total	60-64	65-69	70-74	75+	Total
Bloomington	16	1	-	-	17	516	-	-	-	516
Eagan	338	15	-	-	353	38	-	-	-	38
Mendota Heights	47	1	-	-	48	-	-	-	-	-
Minneapolis	7,671	1,512	-	-	9,183	590	507	-	-	1,097
Richfield	873	60	-	-	933	383	-	-	-	383
All Cities	8,945	1,589	-	-	10,534	1,527	507	-	-	2,034

A total of 1,094 single-family residences and 88 multi-family units within the 60 dB DNL noise contour in the City of Minneapolis were previously entered into the 2017 – 2020 Mitigation Programs. An additional 16 single-family residences within the 60 dB DNL noise contour in the City of Eagan received mitigation eligibility for the 2021 Mitigation Program by virtue of the 2019 Actual Contour. All residential units within the 2019 actual 60 dB DNL noise contour have either received noise mitigation around MSP or are part of the 2017 – 2021 programs.

Projected vs Actual Flights

F-16 EIS vs F-35 EIS Existing Condition (F-16)





New Building Construction

New buildings are better equipped to control or mitigate outside noise levels

Common features expected to perform better at noise reduction:

- Double or triple pane windows
- Solid insulated doors
- Increased wall and attic insulation
- Dense spray foam and rigid insulation
- Tighter overall construction - sealing/caulking seams and gaps

Other building materials and techniques available:

- Sound reducing drywall
- Additional acoustic insulation
- (Resilient) sound channels
- Acoustic sealants

City's Noise Regulations,
CHAPTER 24 - OFFENSES AGAINST PEACE AND QUIET

MGO 24.04, PROHIBITION OF NOISES DISTURBING THE PUBLIC PEACE

- Basically sound amplification, loud parties, excessive, unnecessary noise
- Early morning refuse collection
- Police enforce
  - *If City approves a use or activity that typically makes noise as part of activity, police will not cite (example: sports facilities*)

City's Noise Regulations,

CHAPTER 24 - OFFENSES AGAINST PEACE AND QUIET

MGO 24.08, NOISE CONTROL REGULATIONS *"fixed point, equipment-type noise"*

- Ordinance regulates noise coming from equipment, as measured at a fixed distance or the receiving property line.
- Maximum dBA receiving levels lower at residential zones
- Some exceptions:
  - Emergency warnings, permitted/licensed outdoor gatherings
  - Construction noise (7a-7p M-Sa, 10a-7p Su)
  - Public/private school buildings, Places of worship
  - Licensed and permitted fireworks displays
- Building Inspection is principal enforcement agency